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BASIC ORIENTATION AND EDUCATION OF THE MEDICAL STUDENT

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In the field of medical education there appears to be abundant evidence of growing dissatisfaction with existing programs and of attempts to study current practices critically in order to determine whether changes are necessary and, if so, what changes should take place. There are available to the reader a considerable number of historical reviews, critiques of current programs and suggestions for the future. In many one finds recurrent references to the need for medical students to obtain a broader concept of human biology so that they may apply intelligently and effectively the knowledge accumulated and the skills acquired during their training to the promotion of health, to the prevention of disease and to the study and care of the sick. There is recorded, too, in these reports the need for a scheme of education which would lead to an understanding not only of the disease process but of the total aggregate of biologic experiences, including the psychologic and social aspects. Further, there is recognition of the need not only to understand this total experience as an isolated phenomenon but to relate it to the community in which the physician and the sick person live.

This interest in medical education is not exclusively the concern of formal review boards, curriculum committees or medical educators. The general public has become increasingly interested in the medical schools not only as they relate to the goal of improved health service to the nation but also as they make possible the ways and means to provide the public with better trained physicians.

A central theme in these considerations is the recognition of the need for a broader, a more comprehensive, concept of human biology, a concept which will make possible scientific inquiry into many areas of human behavior previously either totally disregarded by medical science or, if considered, done so more or less exclusively in terms of intuition or revelation. Fundamental in this concept would be consideration of the multiple devices, genically and experientially determined, which may be used by the biologic organism to fulfil its needs, to adapt to and to master its environment from its initial stage of dependent helplessness through an ascending gradient to increasing voluntary control and subsequent discriminatory and economic behavior.

Read at a meeting of the American Psychiatric Association, Montreal, Canada, May 23, 1949.

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It is generally accepted that this approach to a conceptual scheme of biology has become the concern of many disciplines. In human biology a number of sciences (psychology, anthropology, sociology), previously sequestered from medicine, may join psychiatry in attempting to bridge the gap between the physical and biologic sciences on the one hand and the social sciences on the other.

Unlike the social sciences, psychiatry has been and will probably continue to be patient centered. So long as its central concern is the destiny of the patient, regardless of its contributions to either the physical or the social sciences, psychiatry will continue to operate within the field of medical science. The significance of psychoanalytic psychology in affording a more systematic foundation for psychiatry is less of a controversial point in American medicine today than it was two decades ago, when I began the study of medicine. The significance of psychiatry, supported as it is today by psychoanalytic psychology, as one of the disciplines which may play a major role in attaining a more comprehensive concept of human biology has, in my opinion, received less attention.

This paper will consider the role of psychiatry, particularly as it has been influenced by psychoanalytic psychology, in working toward this goal of a more comprehensive concept of human biology. Obviously, knowledge of the setting in which this is taking place is of primary consideration. Intelligent planning for the teaching of psychiatry in medical schools today must be based on a reasonable understanding of the preparation of students who are admitted to the study of medicine, of the conventional conceptual schemes in which medicine is now taught and of the special problems which arise in introducing conceptual schemes which are different from those currently accepted. Consideration of these problems will comprise the major thesis of this paper.

In this paper interest is not restricted to the point to point relationship between undergraduate psychiatric education and special or career training in the field. It will be apparent that what is being considered is the influence of psychiatry in the broadest implications of human biology. Nor is the paper the result of a formal statistical inquiry into method, content and goal of current curricular programs. It is a report based on sixteen years of personal experience with students and faculties of six medical schools.

PREPARATION FOR MEDICAL SCHOOL

Let us consider, first, the preparation and background of medical students. With notable exceptions, there is a significant disparity in the preparation of students who are admitted to medical schools. The collegiate

preprofessional training is apt to be much more thorough and inclusive in physics, chemistry and biology than it is in psychology, sociology, history and literature. There are a number of reasons for this state of affairs. One obvious reason is the remarkable increase of knowledge in the physical sciences and their equally remarkable application to medicine. No one can deny that the most significant contribution to medicine in this century has been the impact of physics and chemistry on biology and the introduction of methods of quantitative measurement in the biologic and medical sciences. The results of these applications are largely responsible for the increase of the life span today. Is it not a logical consequence, then, that the preparatory period in medicine should be concerned with matters which are known and proved to be of utmost importance to medicine? A second reason is that the body of knowledge of the physical sciences not only is applicable to medicine but is systematized and capable of orderly presentation to students. For the most part it is noncontroversial, invested with few irrational emotions and, therefore, easily communicable. A third reason is that until recently there has been little demand from the medical schools for improved or more intensive teaching in psychology and in the social sciences. In the traditional medical scene no one has missed this knowledge very much, nor have medical educators been much impressed by those students who have come to the medical schools with special academic experience in these fields. Other reasons include the fact that the areas of psychologic and social inquiry are more complex, the knowledge obtained is less systematized and the effective application of this knowledge to medicine has yet to be proved. There is, too, a great scarcity of mature, seasoned teachers who have acquired sufficient knowledge and experience and who are able to communicate what they do know clearly and in a stimulating manner. Actually there has been little time afforded teachers of psychology and the social sciences in the preparatory period, and thus they have had little or no opportunity to share their knowledge.

Whatever the reasons may be, the medical student of today is less informed (or is misinformed) in the psychologic and social aspects of human behavior than he is in the physical and chemical aspects. Further, this disparate background, followed as it is by the preclinical years of the medical curriculum, usually leads to a conceptual scheme of human biology in which psychologic and social factors are largely disregarded. However, a change seems to be taking place. My colleagues and I have noticed it in the past three years, and our observations are similar to those made by teaching colleagues in other medical schools. First year medical students seem to be more aware than their predecessors have been of the significance of personal and social factors in human experience. There is an unprecedented eagerness, perhaps an anxious eagerness, on the part of these students to learn more about the nature of man and of his relationship to the society in which he lives. A small number betray their anxiety by an almost childish demand for formulas and for fixed designs for living. It is difficult to know what all the reasons may be for this, and we have not had the opportunity as yet to study this phenomenon systematically. However, our experiences with medical students lead us to believe that the fact that most of them are older and are veterans plays a large part in this change.

Constructive efforts are being made to improve the teaching of psychology and the social sciences in the premedical period. Our impressions, however, are that the student's readiness to begin the scientific study of human behavior appears to be based more on the nature of his previous life experiences than on the knowledge shared and communicated to him in his academic preparation. Whether age or, more appropriately, range of experience and capacity for growth are the variables principally involved remains to be proved.

Many medical schools are making valiant attempts to utilize all methods possible to select students who will become good physicians. So far as I know, no one has been able to define clearly the properties of a good physician. Probability tests, such as vocational aptitude scales, to be valid would have to cover a wide range including the capacity to do investigative work, to administer men and things, to deal with the anxieties and guilts of patients without mobilizing unduly one's own and many other factors.

If the student is to become a physician, that is, to care for the sick, it may be important to know beforehand, if possible, what his potential capacity may be to grow toward emotional maturity. At the present time selection is based on his performance in physics, chemistry and biology. These are given major consideration in the deliberations of most of the admissions committees in medical schools. Many educators believe that good records in these studies not only insure adequate background for an important part of medical education but also constitute a fairly good index of general intelligence and general fitness for medicine. This has yet to be proved or disproved. Others believe that this criterion of selection may eliminate at the outset a number of students with poorer records in these disciplines but with greater potential capacity for emotional maturity and for special aptitudes in personal and social relationships. These issues are presented to you for your consideration, as any program entailing change in the fundamental nature of medical education must be concerned with the preparation and with the readiness of students to participate in this change.

CONCEPTS OF MEDICAL SCIENCE

Next, let us consider the conventional conceptual climate of medical science. I have spoken previously of its dualistic attitude toward mind and body and of its reluctance to inquire scientifically into certain areas of human behavior.

It is evident that because of the great advances in many of the medical sciences, particularly those which necessitate acquisition of special skills, little integration between them has taken place. In spite of sincere attempts to introduce patients to students early in the preclinical period and to foster correlation clinics and courses, knowledge and skills have grown vertically, with little or no horizontal spread.

Furthermore, parts rather than wholes of behavior have been the major concern of medical scientists. The what and the how of parts—or even of the whole—of behavior has always interested the medical scientist more than the why. One cannot help wondering why medical science has been so reluctant to concern itself with purpose and with holistic concepts. That this attitude has existed for some time even in biology is substantiated by E. von Brücke's famous statement, "Teleology is a lady without whom no biologist can live. Yet he is ashamed to be seen with her in public."

Disease is usually interpreted in a static rather than a dynamic sense. To many students the concept of disease is fulfilled by the enumeration of certain objective data obtained by the diagnostician either directly through sensory observation or indirectly through various mechanical extensions of his senses. There has been a tendency to disregard the subjective experiences of patients or to consider them untrustworthy and unscientific. William James' quotation is still apt:

> Many persons nowadays seem to think that any conclusion must be very scientific if the arguments in favor of it are all derived from twitching of frogs' legs—especially if the frogs are decapitated—and that, on the other hand, any doctrine chiefly vouched for by the feelings of human beings—with heads on their shoulders—must be benighted and superstitious.[1]

Little attention is paid to health, and it is often considered in the negative sense of absence of disease. It is challenging to current thought to point out that health and disease are not static entities but are phases of life, dependent at any time on the balance maintained by devices, genically and experientially determined, intent on fulfilling needs and on adapting to and mastering stresses as they may arise from within the organism or from without. Health, in a positive sense, consists in the capacity of the organism to maintain a balance in which it may be reasonably free of undue pain, discomfort, disability or limitation of action including social capacity. Another characteristic of the current understanding of disease is for students to think in terms of unitary cause and effect rather than in terms of multiple interchanging forces. How much of this current thought is due to the very remarkable advances resulting from the germ theory of disease is not known. Critical concern on this point comes not only from psychoanalysis but from the general field of biology. Some years ago Jennings stated, in discussing the fallacy of the single cause:

> This fallacy is the commonest error of science, making unsound a considerable proportion of its conclusions. Everywhere there is a search for "the" cause of this or that phenomenon: the investigator is not content until he has found "it." Yet natural phenomena—and most emphatically is this true of biological phenomena—merely arise out of the complex situation in which they occur. Many elements of that situation affect them; and all that experimental science can do is determine what difference is made by altering one or more of these elements; none is "the" cause to the exclusion of the others.[2]

It is my impression that students are keenly aware of the marked differences in the form and content of teaching between the first two years and the second two years of the medical curriculum. The change from inanimate to animate and, to a degree, from mammalian or infrahuman to human necessitates an entirely new orientation for the student. The student-cadaver relationship is different from the student-patient relationship. Toward the end of the second year the student suddenly finds himself participating in an animate and reciprocal human relationship unlike any with which he has been previously acquainted, unlike—in degree certainly and perhaps in quality—because of the unique properties which this relationship possesses. Not only is it based on mutually realistic appraisals by the patient of the student and by the student of the patient, but also it possesses other qualities, of which neither may be aware consciously and which relate to an accumulation of the past emotional experiences of each. The fact that this interpersonal relationship may in itself be a proper area for scientific inquiry is essentially a new and challenging thought in medicine. Historically the doctor-patient relationship from the time of Hippocrates to the present day has been considered in terms of artistic expression, has been invested with spiritual value and is thought to be acquired only through intuitive means with long experience. The fact that this interpersonal relationship may actually increase the number of variables to be considered in the concept of disease has as yet received little scientific attention either in the field of clinical investigation or in medical therapy.

The student-patient relationships in most teaching hospitals and their outpatient departments do not give the students an adequate opportunity for long term study and continuity of work with patients. This is particularly so with patients who do not respond immediately to treatment and those in whom there is no remarkable change in the experience of pain or disability over a long period. Even the outpatient facility, probably because of its interdepartmental reference system, does not permit the student to obtain long term experience with the patient. Problems of prolonged convalescence, chronic disease and disability are seen in brief and at times discontinuous or random sessions. The continued responsibility for the care of a chronically sick person adds immeasurably to the education of a physician. It requires maturity to be able to recognize limitations, to avoid becoming angry because the patient does not get well, to avoid becoming discouraged or discouraging and to continue to wish to help within the limits of one's ability.

In certain university teaching hospitals the student is not exposed to a sampling of the common illnesses of man. There is a tendency to admit for study only diagnostic dilemmas, and at times this turns into what might be called clinical stamp collecting. One saw the reaction to this in military service, when many of the young physicians appeared to be bored and impatient with men who suffered with the most common complaints of mankind—headache, backache and belly-ache—and felt that they were acting as dignified physicians only when they were presented with evidence of the rarer and more obscure types of disease. With notable exceptions, students have little opportunity to obtain knowledge of the social implications of sickness. They are interested in but frequently do not have an opportunity to learn more about the lives of their patients before and after their stay in the hospital, the restrictions enforced by illness and, in a broader sense, the costs of illness, of hospital care and of community, state and federal public health programs.

Finally, one would not be doing justice to the conventional scene of medicine if one did not consider the relative prestige position of disciplines in the medical school. Until recently psychiatry has had little prestige value. It has been afforded little time in the crowded curriculum. In the past it has been concerned with one small segment of its operational field, namely, the care of the chronically ill, which for the most part has been distant and foreign to the central theme of medicine.

DIFFICULTIES IN THE TEACHING OF PSYCHIATRY

Let us consider how certain difficulties which are encountered not by reason of conventional concepts of medicine but by the nature of the material in psychiatry which is communicated to students. The central

1. Allport, G. W.: Productive Paradoxes of William James, Psychol. Rev. 50: 95-120, 1943.
2. Jennings, H. S.: The Biological Basis of Human Nature, New York, W. W. Norton & Company, Inc., 1930.

consideration of psychiatry is the study of human behavior, including those aspects of human behavior which may be highly invested with emotion, both rational and irrational. Naturally this necessitates a reasonable capacity on the part of the student to be able to deal with these aspects of behavior without their mobilizing unduly his anxiety if he is to operate intelligently and effectively as a physician.

Experience in teaching psychiatry has taught the need for some type of preliminary working-through phase for the students. It is obvious, even to students, that there are considerable differences between communicating knowledge of physics, physiology or, for that matter, infectious disease and dealing with the emotionally invested aspects of human behavior. With regard to the latter, students are apt to bring with them a considerable amount of information and misinformation based on their own lives which when challenged with alternative or conflicting facts or interpretations of facts may provoke anxiety, guilt and resentment. The body of psychiatric knowledge is less systematized, lends itself with difficulty to orderly presentation, is highly complex, and, unlike the other medical sciences, provides little opportunity to isolate variables, so that one or more may be analyzed discretely. Whether the group is small or large, opportunity is afforded for the students to ask questions, to comment, criticize and discuss. Obviously, this necessitates experience and maturity on the part of the teacher adequate to keep his relationship within the realistic ethic of the teacher-student and not, except for special circumstances, make of it a therapist-patient relationship.

I am also convinced of the need for teaching programs to be extended over a long period. Short, intense, concentrated teaching may be of some value in communicating certain technics and skills in a familiar frame of reference but in my opinion restrict and limit the working through or assimilation experience vitally necessary in the learning process of students.

Many students become impatient with the incompleteness of the knowledge in the field of psychiatry. Although they are aware of the lack of metaphysical certitude of all scientific knowledge, they appear to be more distressed with the inadequacies in this field than with those of other medical sciences. For example, they are apt to accept, with little critical challenge, the alleged relationships between hormonal physiology and the menopausal syndrome and attack much more vigorously the concept of regression, which I believe has much more scientific evidence in its support. They are ready to accept the fact, which can be supported by evidence, that people are different. They are also able to consider determinants for these differences in terms of genic and/or experiential factors and thus concede that man's behavior is modifiable through experience. However, they challenge the use of analogic concepts such as that of energy in the psychoanalytic theory of personality. They bristle when one uses quantitative expressions in describing behavior currently not mensurable except in terms of more or less. They are critical of the present classification of sick persons, as it rarely applies to the patients they study on the medical and surgical floors. Although they are impressed with the fact that pediatricians and educators have borrowed generously from psychoanalytic experience in stressing the special vulnerabilities of early human life and the special meanings of suckling, feeding, weaning, toilet learning, play and discipline in infancy and early childhood, they ask to examine the tested knowledge which would support the significance of these phenomena in influencing adult character in health or disease. They ask pertinent, penetrating and embarrassing questions concerning the knowledge, or lack of knowledge, of the normal ranges of reactions of persons to acute and to chronic illness and of everyday social custom in play, work and worship. They inquire into the predictive value of theoretic assumptions and ask why more experiments are not designed to test these hypotheses systematically. They are puzzled when confronted with the close similarity of genetic and dynamic factors in patients who exhibit widely different somatic, psychologic and social symptom formations. In brief, they look forward with realistic and/or neurotic motives to a more orderly, a more systematic and a more thoroughly tested body of knowledge.

SUMMARY

It is evident that psychiatry, largely through psychoanalytic psychology, will play a major role in the scientific humanization of biology. If it can help the medical students to gain a rational understanding of the unique characteristics of the physician-patient relationship, if it can stimulate the student to a better understanding of the psychology of acute illness, convalescence, chronic disability and deformity, if it can teach him the role of personal and social forces as determinants of behavior including somatic, psychologic and social symptom formation, if it can guide him in knowing what he can and cannot do, what he should and should not do in the field of psychotherapy and, perhaps most important, if it makes possible his use of scientific method in all areas of human behavior, it will indeed have been successful.

To those who accuse medicine of having become too scientific, I would counter with the charge that medicine has not become scientific enough. Medicine has used methods of scientific inquiry in those areas of experience which lend themselves to understanding through physics and chemistry. It has only begun to use methods of scientific inquiry into areas of human experience previously dealt with and approached by intuitive and inspirational means. This is the major responsibility of psychiatry in medicine, as, in my opinion, the functions of medicine are to acquire knowledge and to apply it to promote health, to prevent disease, to free man and to help man free himself from the enslavement of pain and disease and from the equally great enslavement of morbid fear and guilt in order that he can function to his maximum capacity as a conscious, intelligent and rational human being.

Viral Variation.—Centuries before the sciences of bacteriology and of virology were developed, the reality of viral variation was appreciated in the Orient in connection with variolation as a prophylactic for smallpox. In the intervening years, almost up to the present time, Jenner's introduction of vaccination and Pasteur's production of a variant of rabies virus represent the only important contributions to variation in viruses. With the establishment of the basic principles of virology in the last fifty years, studies of viral variation have revealed data of fundamental biologic significance. In this connection may be mentioned the production of the attenuated 17 D variant of yellow fever virus (146), the transformation of the fibroma virus into the virus of infectious myxomatosis (8), and the recombination of bacterial viruses (88, 107). The use of the attenuated variant of yellow fever virus for the immunization of man has proved to be the most important practical result of all investigations of virus diseases infecting man.—B. A. Briody, Variation in Influenza Viruses, *Bacteriological Reviews*, March 1950.

RESETTLEMENT OF THE DISPLACED PHYSICIAN IN THE UNITED STATES

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When the International Refugee Organization of the United Nations took over the care of the refugee population of Europe in July 1947 there were over a million and a half persons who were under its general protection, while slightly over 700,000 of these were entirely dependent. By July 1948 there were 599,000 receiving care and maintenance. On March 31, 1949, the number was 483,715. The latest figures are not available. Many of these persons are fugitives from countries now under the domination of Russia, and their known opposition to Communism makes a return to their own homes impossible. A number of national groups are represented, including those of Poland, the Baltic States, the Ukraine, Czechoslovakia, Yugoslavia, Rumania and Hungary. The resettlement of these displaced persons is one of the prime responsibilities of the International Refugee Organization. It is aided by various voluntary agencies most of which represent religious groups. Voluntary agencies from the United States include Roman Catholic, Protestant and Jewish organizations.

In this group of displaced persons there were, in September 1948, 2,560 physicians registered with the I. R. O. and certified by that body for the medical care of their compatriots. These have been acting as camp physicians, have staffed the hospitals taken over by I. R. O. and have carried out public health and preventive medicine. Although living conditions have been poor indeed and the food allowance low in calories and critically low in protein, the health records of the displaced persons generally, including infant mortality and contagious disease control, will bear comparison with those of any country. Resettlement of physicians has been slow, and it is believed that almost 2,300 remain in Europe at the present time. Most of the doctors of Jewish faith have been resettled, largely in the state of Israel. Almost all those who remain in Europe are of the Roman Catholic, Eastern Orthodox and Protestant faith. The latest figure obtained gave the number of Catholics as about 35 per cent of the whole and the number of Jews as about 10 per cent. These are not official figures. Under the present law governing the immigration of displaced persons from Europe, doctors continued to land in this country, and although no figures are available I believe that the number per month is increasing because of the efforts of all agencies concerned. This is due to the fact that the International Refugee Organization is not authorized to continue in existence beyond 1950.

What, then, shall be our attitude toward these European colleagues who are being brought to our shores? This is a particularly important question for this body. As a former member of a State Licensing Board, I am fully aware of the problems and responsibilities involved. We are faced with a situation which may be summarized as follows:

1. There exists in many parts of this country a definite need for more physicians.

2. There is at present a large group of physicians rendered homeless in Europe who desire resettlement, especially in the United States, and some of whom already are here.

3. Protection of the health of the population of this country requires that none but well trained physicians be admitted to practice.

The problem, then, is to select from this group those whose qualifications are such that they safely can be admitted to private practice, or to public health, laboratory or institutional work in this country. The situation is new, and the regulations which have been set up in most states with a view to excluding doctors who had obtained cheap diplomas in Europe or were cast-offs or misfits in their own countries are not applicable. We are dealing with populations of highly civilized countries and with medical groups which include all types, teachers, investigators, practitioners and specialists of every sort. It is as if the entire population of such a city as Chicago, Boston or San Francisco were suddenly rendered homeless and being resettled in a new land. Everyone, good, bad and indifferent, is included.

How shall we assess the qualifications of these displaced physicians in general and of the individual physician in particular? Our first move may well be to examine what evidence exists in the records of surveys that have been made by the I. R. O. The statistics published in September 1948 are summarized in the accompanying tables.

TABLE 1.—*Refugee Physicians: Teaching Experience*

Professors	40
Associate professors	15
Docents (lecturers)	26

TABLE 2.—*Refugee Physicians: Age Grouping*

20-25	20
26-35	692
36-45	840
46-55	606
56-65	253
Over 65	50
	2,561

Attending the refresher courses given to displaced physicians at Munich in 1948 were 152 doctors, of whom 7 were full professors, 7 associate or assistant professors, 9 docents and 46 had been at the head of hospital services in their respective specialties. This was, of course, a picked group, and the excellent impression made on my colleagues and me, who conducted these courses, cannot be considered a fair estimate of the whole body of displaced physicians. It can, however, be admitted as evidence that among these physicians there are certainly a number who are of the highest type.

The figures in table 2 indicate that among this group of physicians there are many of maturity and experience. By the same token there are many for whom, despite their excellence in their chosen specialties or fields of teaching or research, it would be difficult if not impossible successfully to take the general board examinations required of recent graduates.

Table 3 shows the number of individual physicians who have been checked by the I. R. O. and accepted for general practice or certified as specialists in the various fields of medicine.

This brings up the subject of screening and certification of those persons among the refugee population

Read before the Forty-Sixth Annual Congress on Medical Education and Licensure, Chicago, Feb. 7, 1950.

who registered with the I. R. O. as physicians. "Screening boards" were set up under the supervision of I. R. O. medical officers and "were composed of refugee doctors whose ability and integrity were established, and whose reputations are, in many cases, international. The President of the Board in the British Zone of Germany was Dr. Primanis, former Professor of Anatomy at Riga University and former Rockefeller Fellow in the United States. In the American Zone Dr. Jeno Kramar, formerly Professor of Pediatrics and Director of the University at Szeged, Hungary, also a former Rockefeller Fellow, presided over the Board." Professor Kramar is well known to me as he attended the first of the refresher courses and took part in the teaching of pediatrics when the instructor in that subject, because of a tragic death in his family, was forced to be absent for two weeks. I consider him one of the best teachers and most distinguished gentlemen whom I have ever met. He is now in this country or is about to arrive and will be available to give personal testimony as to qualifications of displaced physicians generally should such further evidence be needed.

TABLE 3.—*Refugee Physicians, June 1948*

General practitioners	1,616
Internal medicine	157
Pediatrics	88
Tuberculosis	36
Neuropsychiatry	52
Dermatology and venereal disease	52
Radiology	29
Stomatology	66
Tropical medicine and hygiene	11
Anatomy and histology	10
Physiology and biochemistry	4
Pharmacology	4
Bacteriology and protozoology	42
Pathology	15
Forensic medicine	3
General surgery	135
Orthopedics	8
Gynecology and obstetrics	129
Ear, nose and throat	51
Ophthalmology	50
Urology	12
Total	2,500

These screening boards were made up of five members and from five to eight consultants in various branches of medicine who were of eight different nationalities and spoke ten languages. Their method has been as follows:

> A detailed preliminary study of rules and University curricula pertaining to medical qualifications and registration in all countries concerned was made. The large majority of candidates presented authentic original diplomas and supporting documents. Where there was any doubt regarding the authenticity of statements or documents, the applicant was asked to submit to an oral examination before the whole Board. Among the nationalities concerned were Estonians, Lithuanians, Latvians, Hungarians, Polish, Ukrainian-Polish, Croats, Chinese, Bulgarians, Slovenes, Turkish and Stateless persons.
>
> All claims were thoroughly investigated by the Boards and only physicians presenting strong guarantee of their qualifications were registered as doctors. Moreover, the standard of qualification required was set on a uniformly high level, comparable to those in the countries where they are likely to emigrate.

The following quotation is also from the September report of the I. R. O.:

> This pool of skilled expert physicians is without parallel in history. They possess the qualifications and qualities demanded by any country to improve the health of its citizens. On an average each doctor knows at least three languages, and a great number have taught in universities and hospitals of their own countries; some have studied in foreign countries; many are still pursuing their research under very difficult conditions.

This gives us a glance at the more favorable side of the picture. Opinions based on other evidence have been expressed. In a recent survey (November 1949) Captain Harry C. Oard, of the Medical Corps of the United States Navy, stated that at present he calculates that not more than 10 per cent of the displaced physicians now in Germany are employable in the United States or its dependent areas. This judgment is based on a careful study in which such defects as age, dependent relatives, general appearance and character are given weight and a lack of familiarity with the English language is particularly emphasized. He qualifies this further by the statement "With retraining and a period of supervised activity in modern clinical medicine many others could become acceptable by United States standards." He further shows that among the 240 persons whom he studied only 8.4 per cent were found to be professionally incompetent.

When it is realized that the average refugee physician has learned to speak three or four languages, it is evident that the language barrier is one that can be overcome in practically every instance. Yet this was the most important "defect" noted by Captain Oard (in 117 of 240 physicians interviewed). It must further be noted that Dr. Oard was looking for young and healthy persons for a particular type of service and was not interested primarily in the elderly and experienced physicians, many of whom have already been found to be able to occupy responsible positions in institutions and in certain teaching positions.

Furthermore, the presence of dependent families is again not to be rated as a "defect." While it is necessary to provide for such dependents, if adults they are often employable in various ways and if children they are future citizens and as such an asset to the community. A number of refugee physicians with dependent relatives are already in this country and are carrying on in positions which enable them to give their families support.

It is my opinion that Captain Oard is probably correct in his conclusion that not over 10 per cent of displaced or refugee physicians are immediately employable. Certainly not more than that number, no matter what their professional training, should engage at once in practice in American communities without becoming professionally and socially adjusted. The lack of familiarity with customs and usages has led many a foreign physician to make errors in dealing with his patients and his colleagues that have earned him the ill will of his brother practitioners and have given a bad name to refugee physicians generally. I believe that no one will question the value of a training period for any physician who has not already studied or at least resided in this country for a period of several months.

How can such training be given? The state of Iowa is leading the way. The following action was taken at a meeting of the Board of Medical Examiners:

That the State Board of Medical Examiners approve the appointment of physicians who are graduates of foreign medical schools, including displaced physicians, as assistant physicians in the four State mental hospitals—Clarinda, Cherokee, Independence, Mount Pleasant, and the Woodward Hospital and School and the Glenwood State School, on the condition that their medical work be supervised by a licensed physician, and that they be provided with definite courses of instruction by members of the hospital staff, and such other recognized medical teachers as may be available. It was further requested that attendance at such courses of instruction be properly graded, and a report of the same be submitted to the State Board of Medical Examiners each quarter. At the end of one year of service, the further course of each assistant physician will be individually considered by the State Board of Medical Examiners.

This is certainly a forward step. If the majority of our states could adopt this plan, the screening and reorientation could be carried on in such a manner that qualified physicians could be reconditioned as it were for resettlement in our communities and at the same time the work of our state institutions, where there is so often a lack of medical personnel, could be aided. In Rhode Island, also, a similar plan is in force under a ruling of the Civil Service Commission, which allows unlicensed physicians to be employed under the supervision of licensed physicians, so long as there are no licensed physicians available to do the work. It was my privilege to select three outstanding persons who have come with their families to Rhode Island and are rendering excellent service to the state. It is understood, further, that in both Ohio and Colorado it has become a bit easier for qualified foreign physicians to be admitted.

TABLE 4.—*Regulations for Acceptance of Displaced Physicians in 48 States and 5 Territories*

"Not accepted"	22
Citizenship required	20
First papers required	8
Internship required	20
"Further training" required	7
Examination required	53

When we consider what the displaced physician faces when he comes to this country, it is felt that, though we are, I believe, as by tradition we should be, the most liberal of all nations to the immigrant, nevertheless the hurdles which he faces are almost insurmountable. In certain states where the regulations seem reasonable the displaced physician is met by such a barrage of petty technicalities and double talk that it almost looks as if a decision had been made to exclude everyone of foreign origin. Table 4 summarizes the situation.

In certain states interpretation of their regulations is carried to an extreme. For example, one state requires that the physician produce written evidence of graduation from a medical school signed by the dean of the school. In one instance which was brought to my attention the physician was told that he must get such evidence although his medical school in Lithuania was in the hands of the Russians, from whom no help could be expected, and despite the fact that the physician who was his dean at the time he was a student is now in Chicago and willing to vouch for him.

The recent report of the Committee on Displaced Physicians of the American Medical Association, published in THE JOURNAL of December 24, is of interest. The following recommendations were adopted:

1. That the American Medical Association suggest to the state medical examining boards and to the Federation of State Medical Boards of the United States that they give special study to the present unique situation with respect to displaced physicians with the idea of framing special regulations to meet it.

2. That the plan of accepting I. R. O. certification in lieu of other evidence of graduation and professional status when such evidence cannot be obtained be suggested to the state medical examining boards.

3. That efforts be made by the state medical boards to arrange for the appointment of displaced physicians in state hospitals, as has been done in Iowa, and in such other hospitals as may be possible, to allow such physicians to become acquainted with American medical methods and practices.

4. That state medical boards be urged to consider the framing of special regulations designed to make it possible for specially qualified displaced physicians to be licensed for limited practice in communities and hospitals where their services are needed.

5. That the American Medical Association recommend to the appropriate departments of the federal government that steps be taken to allow the utilization of the services of displaced physicians, certified by the International Refugee Organization, in federal services, such as the Indian and Alaskan services under the Department of the Interior, where it is understood there is a great need for more physicians.

6. That a copy of this resolution be sent to the secretary of each state medical examining board and to the Secretary of the Federation of State Medical Boards of the United States.

It may be well to discuss paragraph 2 of this report a little further. It is the recommendation that I. R. O. certification be accepted by state boards. The following description of the exact requirements that have been made by the screening boards is quoted from a letter just received from Dr. Coigny, Director of Health of the I. R. O.

1. The personal presence of the professional men seeking registration. In effect, practically all physicians and surgeons appeared before the boards, as registration was an essential measure in being known as qualified for possible resettlement as a professional man.

2. Proof of identity.

3. Production of diplomas, documents or other relevant material available.

4. Absolute proof of qualifications. In most cases original documents or photostats existed. In others, reference to the medical registers for qualifications in various countries was possible. In other cases again there was available the evidence of former teachers or fellow graduates of known integrity whose evidence was taken on affidavit.

5. For specialist claims there were clinical examinations as well as verification of the experience of which claims were made. In this connection, it is wise to remember that the

specialist is much more widely used on the Continent of Europe than in the United Kingdom or the United States of America.

It is to be noted that the ratio of physicians to population among the displaced persons of Europe is high and there has been no pressure whatever to admit to practice any who were not considered fully qualified.

The certificate of professional status issued by the I. R. O. on the basis of these examinations is as follows:

INTERNATIONAL REFUGEE ORGANIZATION

CERTIFICATE OF PROFESSIONAL STATUS
THIS IS TO CERTIFY THAT

.....

Nationality..... Age..... Has Been Found to be a Qualified.....

After Examination of.....Professional Qualifications by the Special Qualifications Board in.....

and Graduated on.....in Accordance with the Regulations of.....

I. R. O. Medical Register No.:.....

Additional Qualifications:

.....

.....

.....

Signed: Signed:

President of Special Chief Medical Officer

Qualifications Board IRO.....

At..... on.....

The foregoing representations, based on investigations by competent persons, are correct to the best knowledge and belief of the undersigned.

Signed .....
Director General

SUMMARY

1. The presence of a large number of physicians who are displaced persons in Europe, many of whom desire to emigrate to the United States, and will succeed in doing so, and the presence of a smaller number of such physicians who have already arrived present a problem to the medical profession and particularly to the medical licensing bodies of each state.

2. Among the group of displaced physicians are many of high professional caliber and a number whose age and degree of specialization make it difficult for them to take routine general examinations successfully, unless especially rehabilitated and prepared.

3. Some of these physicians are without proper certificates of graduation from medical school, but all have been carefully screened by I. R. O. committees, and certificates have been furnished to them. Most of them also have records of satisfactory work performed as physicians under the I. R. O.

4. The problem which faces our state medical boards in protecting and enhancing the health of our people and which involves in fact the primary function for which our boards have been established is (1) to admit to practice those who can be shown to be qualified and (2) to exclude those who they can show do not possess adequate professional qualifications. In order to carry out the second function, that of excluding the unfit while fulfilling the equally important first function, special study of the situation which now presents itself and appropriate modification of regulations without lowering of standards are needed.

SUGGESTIONS

The problem has been presented but not answered. It would be presumptuous for me to propound categoric recommendations to the members of this Federation. The following suggestions are put forward in the hope that they may, perhaps, serve as a basis for discussion which may produce enough light on this difficult subject to help toward a solution.

1. It is suggested that certification by the International Refugee Organization be accepted as evidence of graduation in medicine.

2. It is further suggested that the restrictions on licensure of European physicians who have graduated in the last ten years be lifted in the case of those who have received I. R. O. certification.

3. The plan of allowing foreign physicians to work in state institutions and other hospitals, which has been initiated in Iowa, with an attempt to provide definite training for such physicians, is strongly recommended.

4. It is suggested that those states in which foreign graduates are "not accepted" revise this restriction to allow their citizens to benefit from the medical talent now made available by the arrival of the displaced physicians from Europe.

5. It is suggested that state medical boards consider possible training facilities that may be available for foreign physicians in their own states and also the policy of giving approval to any courses of training that may in the future be organized by medical schools, hospitals or other agencies for the specific purpose of orienting and training foreign physicians for medical practice in the United States.

6. A further suggestion is advanced, based on information that has just been received since this paper was written. This information, which will be stated more in detail in the discussion by Dr. Graef, from whom I have received it, is, briefly, as follows:

We are informed that the principal American agencies dealing with displaced persons, including the American section of the I. R. O., have developed a plan to request the International Refugee Organization to pay the cost of processing, screening and finding resettlement opportunities in the United States for displaced European physicians and eligible members of other professions. To insure the success of this plan, including a wise distribution of the displaced physicians, it is believed that the transition from displaced persons camps to American hospitals or practice should be under the supervision of American medical authorities. Because of their responsibilities to the American public the state medical boards and the Council on Medical Education and Hospitals should take the leadership in this matter. It is therefore suggested that the Federation of State Medical Boards of the United States consider recommending to the Board of Trustees of the American Medical Associtaion that a temporary national committee or commission be set up with suitable regional subcommittees to undertake the selection of such displaced physicians as should be resettled in America.

Rhode Island Hospital.

ABSTRACT OF DISCUSSION

DR. IRVING GRAEF, New York: The problem of displaced physicians is not unlimited, although it is complex. We can assume that it will not go on indefinitely. It involves about 2,400 physicians, or about 1 per cent of our present physician population. The present group is composed of persons who are largely of rural or small town origin and can be expected to adapt to similar communities when ready to practice in America. Their origin is in contrast to that of the predominantly urban group of prewar European emigrés. Their resettlement can be controlled through the migration facilities of the I. R. O., the President's Displaced Persons Commission, the sectarian or public welfare agencies and various state displaced persons commissions, to permit relocation based on opportunity, local needs and retraining, as defined by each state that seeks to pick the good men among them. This requires an acceptable method of selection, which we believe is now possible if Dr. Burgess' last suggestion is followed. I should like to review briefly data regarding the prewar refugee physicians who have been resettled for the past nine to twelve years. These data were obtained by an independent study committee led by Prof. Maurice Davie, of Yale University. In his report (Refugees in America: Report of the Committee for the Study of Recent Immigration from Europe, New York, Harper & Bros., 1947) the chapter on physicians was based on the work of our committee, which was founded as a nonsectarian organization in 1939. Our committee has been affiliated with the United Service for New Americans, which in turn has been supported by funds from the United Jewish Appeal. We have acted as an advisory group and have always required proficiency in English and a favorable professional evaluation from our Advisory Medical Committee, composed of consultants in each of the specialties, as well as approval of credentials by the New York State Board of Examiners, to exclude unfit persons from committee assistance. Since 1941 we have also required at least one year's American internship for continued financial assistance. In the case of dentists with M.D. degrees we have refused sponsorship for the practice of medicine. In the case of men who have failed state licensing examinations more than three times, we have also withheld sponsorship. Except in unusual cases, the committee has refused to give financial assistance for settlement in medically crowded communities. We have registered, interviewed and otherwise assisted about 6,000 immigrant physicians since 1939. During the war, through direct cooperation with the Office of Procurement and Assignment of the War Manpower Commission, about 500 physicians were placed in various jobs—internships, residencies, locum tenens, industrial positions or practice in many states. Since the war our committee has continued as the only available medically oriented agency in its work and registers those immigrant physicians who are referred to it or seek its help in New York City. Hundreds of the postwar displaced physicians were incarcerated in concentration camps, and they especially need help. In many cases their papers were confiscated, and this imposes a great handicap in meeting the legal requirement of the state licensing boards. Dr. Burgess' suggestion of accepting I. R. O. certification would be helpful, but we recommend a careful review of the evidence leading to certification by our own constituted medical authorities. Can America absorb the remainder of the displaced physicians who want to come here? The Davie survey, previously mentioned, was a questionnaire follow-up in which 1,600 replies suitable for analysis were obtained from 4,000 inquiries. The answers came from persons located in 455 communities in 41 states, the District of Columbia and the Virgin Islands. Fifty-five per cent were in New York State (40 per cent in New York City); 25 per cent in Illinois, Ohio, California and Massachusetts and 20 per cent in other states and areas. Except for a greater concentration of Jewish immigrant physicians in New York City and of Gentile immigrants in other cities of one million or more population, there was no appreciable difference in the distribution of refugee physicians according to the size of the community. There are many men of distinction among them; 67 were listed in "American Men of Science" in 1944, and many have made important contributions to American medicine. Only 5 per cent reported a language handicap as a problem in their early adjustment. The majority acknowledged difficulty preparing and taking state board examinations, but 88 per cent obtained a license by examination, many on the first attempt. Of the group studied, only 7.5 per cent obtained their license by endorsement. Of the loans which the sponsoring agencies made to men whom we recommended, better than 98 per cent have been repaid. These data indicate the ease with which our country can absorb many displaced physicians. The 6,000 already absorbed amount to only 3 per cent of our physician population. Even if all the remaining displaced physicians were to enter the United States, and we do not propose this, they would constitute only an additional 1 per cent, without allowing for the diminution in number by mortality of the older immigrants in the past seventeen years. There is said to be a likelihood that the modified Displaced Persons Bill, now being amended in Congress, will become law this spring. It is part of the plan of the President's Displaced Persons Commission and the American section of the I. R. O. to request the latter organization to pay the administrative expenses for the work involved in processing, screening and finding resettlement opportunities for displaced European professional persons, including physicians. We concur with Dr. Burgess in the belief that the transition of physicians from D. P. camps to American hospitals or practice should be under the supervision of regularly constituted American medical authorities. If a new temporary national committee or commission were set up in key states or cities, some order could be brought out of the chaos of the present situation. Such an agency could provide refresher training, if desirable, overseas and in the United States, as well as hospital retraining in United States approved hospitals, prior to admission to state board examinations. We have reason to believe that such a new joint committee or agency would be assisted by the I. R. O. in its functions at no cost. Through the I. R. O., travel could be arranged for a special screening committee, or teams, which could select candidates overseas, to avoid the premature arrival of physicians for positions for which they are not suitable. Such a plan will rapidly resolve the displaced physicians problem, prevent undue concentration in any area and permit a wide distribution based on need and community acceptance. Reasonable tests of competence before, during and after the process of temporary resettlement and retraining are in order to determine eligibility for permanent license. We will all profit from a wise and just course of action in the spirit of American traditional hospitality, within the meaning of the immigration laws, and with safety as far as professional and public welfare is concerned.

Fat Absorption.—All will remember the widely accepted lipolytic theory which postulates that fat is split completely by the action of pancreatic enzyme, steapsin, to fatty acid and glycerol as a preliminary to absorption. The fatty acids are absorbed as such through the assistance of the bile acids with which they form water-soluble complexes. Some fatty acids undoubtedly may be absorbed as water-soluble soaps. When they arrive within the epithelial cell, they are promptly resynthesized to the neutral fat, in which form they are transported to the liver and tissues. According to this long-accepted theory, fat absorption results only when such hydrolysis has occurred.

The partition theory of Fraser puts forward an entirely new concept of fat absorption from the gastrointestinal tract. The splitting which is brought about by lipase is only minor. This results in the formation of some mono- and di-glycerides, some glycerol, and a limited quantity of free fatty acid. The mono- and di-glycerides in the presence of bile salts give an extremely effective emulsification medium so that the bulk of the neutral fats is emulsified to such extremely small fat droplets that they can readily be absorbed through the walls of the intestine as unhydrolyzed fat. In order to pass through this membrane, they must be reduced to a diameter of less than 0.5 micron. Fraser has amassed considerable evidence in support of this theory.—Harry J. Deuel Jr., Lipid Metabolism, *California Medicine*, April 1950.

PRESENT STATUS OF GOLD THERAPY FOR RHEUMATOID ARTHRITIS

R. H. FREYBERG, M.D.
New York

With progress in medicine it is appropriate that critical appraisal of current means of treatment be made. Such is the position of members of the medical profession today in the field of rheumatic diseases, especially in the light of recent knowledge of effects of steroid hormones in patients with arthritis. Appraisal of gold therapy is particularly appropriate because this year finishes two decades of trial of this form of treatment in Europe and one decade of study of this treatment in the United States. To determine what this experience has taught, these questions should be considered:

1. Is gold therapy of sufficient value that it be included in treatment programs?
2. What are the limitations of this form of treatment?
3. What toxicity is encountered?
4. If gold compounds are used, what is the best method of administration?
5. Can improvements be expected in the future?

To answer these questions effort has been made to evaluate, as fairly as possible, information in published reports and results, some of which have not yet been published, that were observed in the laboratories and clinics with which I am associated.

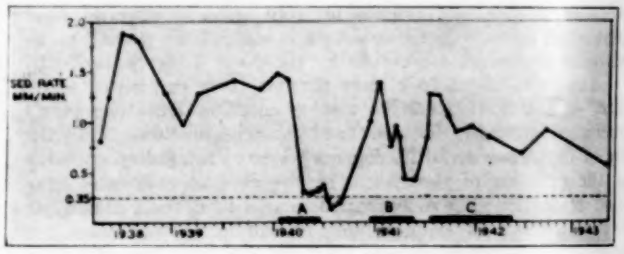
IS GOLD THERAPY OF SUFFICIENT VALUE TO JUSTIFY ITS USE?

Answer to the question whether gold therapy is of sufficient value to justify its inclusion in treatment programs will depend to a certain extent on conditions surrounding the observations and on criteria employed. These facts should be kept in mind: Until a few months ago criteria had not been adopted to provide uniform conditions for evaluating rheumatoid activity or effects of therapy [1]; rheumatoid arthritis is a disease of protean nature, the course of which varies greatly in different patients but usually is characterized by remissions and relapses; gold preparations of widely different nature have been employed with different schedules of dosage, and patients have been treated in different stages of the disease. These and other variables make it difficult to compare the reports of many different investigators, which are the best basic data available.

Some brilliant results have been obtained, characterized by complete clinical arrest of the disease and return to normal of the erythrocyte sedimentation rate. An example of this from my experience is shown in the figure (*A*). In many persons the disease has been much improved but not arrested. Some patients have not been helped by gold therapy. Reports of many observers are summarized in table 1. The few studies in which simultaneous control patients were observed have without exception shown benefit from use of gold compounds (tables 2, 3 and 4). The current report of Adams and Cecil [2] clearly indicates the value of gold salts in early rheumatoid arthritis. The majority of investigators of this form of therapy consider it to have value sufficient that they have continued to employ it. The manner of action of gold salts is not known. Recent investigations suggest, although they have not proved, that gold salts exert their effects at the tissue level, probably by changing enzyme actions.

WHAT ARE THE LIMITATIONS OF GOLD THERAPY?

Gold salts for arthritis have been flagrantly misused. Gold can be helpful only for rheumatoid arthritis with the possible exception of palindromic rheumatism [3] (which may be atypical rheumatoid arthritis). Patients with osteoarthritis, infectious arthritis or gout and with rheumatic complaints but without arthritis have received gold salts. Not all patients with rheumatoid arthritis can be helped by gold therapy. Inactive disease and the structural damages cannot be altered by a gold compound, nor can it straighten deformed extremities, free ankylosed joints or rebuild cartilage and bone. The only value to be expected from gold therapy, but a response which is of great benefit when it occurs, is that the activity of the disease may be reduced or even arrested. Consequently, the logical candidates for gold therapy are patients with active rheumatoid arthritis who have little or no articular damage and who are



The erythrocyte sedimentation rate in relation to gold therapy in a male patient who had complete remission of rheumatoid arthritis. He received (*A*) 50 mg. gold sodium thiomalate weekly in 1940 from January to June (total dose 1,020 mg.) without toxicity and with 4 plus subjective and 4 plus objective benefit. Note relapses following discontinuance of gold salts and improvement after reinstitution of gold therapy. In 1941 (*B*) he again received 50 mg. gold sodium thiomalate weekly (total 840 mg.). After a two month discontinuance he received (*C*) aurothioglucose in oil, 50 mg. weekly for thirteen weeks (650 mg.), then 25 mg. until a total of 1,225 mg. had been given.

not improving from a good program of therapy employing all other valuable treatment procedures. In the majority of instances rheumatoid spondylitis is not helped by gold salts. Patients with rheumatic fever or diffuse lupus erythematosis usually become worse when treated with gold therapy.

Another fact important in consideration of the limitations of gold therapy is that relapse or exacerbation frequently occurs after cessation of treatment even though improvement has been of high order (figure). The relapse rate has been reported to be as high as 75 per cent.[4] Lack of benefit in some patients and relapses in others in one study [4] indicated that at the end of a five year period there may be little difference in the patient whether or not gold therapy has been used. However, this is only one criterion of the effect of gold therapy; it should be remembered that discomfort and incapacitation, in fact, all effects of the illness, may

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3. Boland, E. W., and Headley, N. E.: Treatment of So-Called Palindromic Rheumatism with Gold Compounds, Ann. Rheumat. Dis. **7**: 246, 1948.

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be significantly reduced through the course of disease with the aid of gold salts, so that the patient may have a much more normal life during the five years under consideration. Potential toxicity is the chief reason that gold therapy has not been employed more extensively.

WHAT TOXICITY IS ENCOUNTERED WITH GOLD SALTS?

Toxicity from gold salts depends on the preparation employed, the manner of use particularly in regard to the dose at each injection, the precautions taken and, of course, the criteria used to evaluate toxicity. All preparations of gold that may have therapeutic value also have potential toxicity. Gold may act as a parenchymatous cell poison, but in human beings the toxicity appears most often to be on an allergic basis.[5] Toxic manifestations may occur at any time during or shortly after treatment, although most often they are encountered after 300 or 500 mg. of gold salt have been administered or when gold therapy is reinstituted after a period when it has been discontinued.

TABLE 1.—*Therapeutic Results of Gold Salts for Rheumatoid Arthritis Combined from Many Reports Between 1935 and 1948*

		Range	Average
Eighteen series of cases, total number of patients	4,086		
		%	%
Arrested or greatly improved		40 to 84	61
Moderately improved		10 to 40	24
Sundelin's report * (1948), number of cases	2,441		
Improved (degree not specified)			90

* Sundelin, F.: Complications Due to Gold Treatment in Chronic Polyarthritis, Nord. med. **37**: 303-307 (Feb. 13) 1948.

TABLE 2.—*Summary of Report of Controlled Study of Gold Therapy for Rheumatoid Arthritis by Ellman, Lawrence and Thorold (1940)**

Patients	Preparation Used	Asymptomatic and Normal Erythrocyte Sedimentation Rate, Percentage	Total Improved, Percentage
60	Aurothioglucose	62	94†
30	Placebo	10	76

* Ellman, P.; Lawrence, J. S., and Thorold, G. P.: Gold Therapy in Rheumatoid Arthritis, Brit. M. J. **2**: 314-316 (Sept. 7) 1940.
† To greater degree than in controls.

Manifestations of gold intolerance (toxicity) are many and varied; most common are the cutaneous irritations. With few exceptions dermatitis, when it occurs, is preceded by pruritus which may be mild or intense, localized or generalized, so that this symptom is the most valuable alarm signal of developing intolerance. Dermatitis may be of many different forms including simple erythema, morbilliform rash, pityriasis rosea-like eruption, eczematoid and weeping eruption about the ears, eyes, mouth and axillas, vesicular dermatitis, discrete lesions resembling lichen planus or even simulating mycosis fungoides and generalized exfoliative dermatitis—the most serious and troublesome to manage. These different forms of dermatitis are usually chronic and may produce much discomfort for many months; however, they usually heal completely. Stomatitis often occurs with dermatitis; it may exist alone. "Metallic" taste may precede stomatitis. Other alimentary disorders such as anorrhexia, abdominal cramps and ulcerative enterocolitis have been reported. Hepatitis, if it is ever due to gold toxicity, is rare. Nephritis may occur, and this form of toxicity has not been sufficiently appreciated. Blood dyscrasia due to gold seldom occurs, but when it does it may be serious, even fatal. Thrombopenic purpura, hypoplastic or aplastic anemia and granulocytopenia have been reported. Eosinophilia frequently precedes or accompanies gold intolerance and may help to forewarn of toxicity.

TABLE 3.—*Summary of Therapeutic Effect of Frazer's Controlled Study of Gold Therapy for Rheumatoid Arthritis (1945)*[8]

Improvement	Patients Treated with Gold Compound: Number	Patients Treated with Gold Compound: Percentage*	Patients Given Placebo: Number	Patients Given Placebo: Percentage*
Great	24	42 (56)	4	8 (33)
Moderate	12	21 (14)	6	13 (26)
Slight	11	19 (11)	11	24 (13)
No change	5	9 (16)	10	22 (13)
Worse	5	9 (3)	15	33 (15)
Total	57		46	

* Figures in parenthesis are the patient's independent estimate of effects.

Incidence of Toxicity.—Toxic complications have been reported with an incidence as high as 51 per cent [6] and as low as 4 per cent.[7] The average incidence of all types of toxicity in a large group of cases reported by various authors is 37 per cent. In their reports about toxic complications most authors have included minor abnormalities, many of which may not be manifestations of gold toxicity. For instance, Fraser [8] found that among arthritic patients who received injections of an inert substance not containing gold to control the study of effects of gold salts administered to other patients the physician (who did not know the solution injected was a placebo) considered manifestations of "gold toxicity" to occur in 27 per cent of cases. Mortality, reported to be as high as 3 per cent in 1935, fell to approximately 0.4 per cent for the period 1939 to 1945.[9] The lessened mortality results from: (1) employment of smaller doses of gold preparations;

TABLE 4.—*Summary of Therapeutic Results in the Controlled Study of Gold Therapy for Rheumatoid Arthritis by Waine, Baker and Mettier (1947)**

State of Disease at End of Observation	Patients Treated With Gold Salt: Number	Patients Treated With Gold Salt: Percentage	Patients Treated Without Gold Salt: Number	Patients Treated Without Gold Salt: Percentage
Arrested	12	21	6	9.7
Decidedly improved	21	36	12	19.4
Improved	14	24	17	27.4
Unimproved	11	19	27	43
Total	58		62	

* Waine, H.; Baker, F., and Mettier, S. R.: Controlled Evaluation of Gold Therapy in Rheumatoid Arthritis, California Med. **66**: 295-296 (May) 1947.

5. Freyberg, R. H., in Comroe, B. I.: Arthritis and Allied Conditions, edited by J. L. Hollander, ed. 4, Philadelphia, Lea & Febiger, 1949, p. 258.

6. Graham, J. W., and Fletcher, A. A.: Gold Therapy in Rheumatoid Arthritis, Canad. M. A. J. **49**: 483-487, 1943.

7. Oren, H.: Gold Salts in Treatment of Rheumatoid Arthritis: A Report on One Hundred and Fifty Additional Cases, M. Rec. **159**: 420-421, 1946.

8. Fraser, T. N.: Gold Treatment in Rheumatoid Arthritis, Ann. Rheumat. Dis. **4**: 71-75, 1945.

9. Hench, P. S., and others: Rheumatism and Arthritis: Review of American and English Literature of Recent Years (Ninth Rheumatism Review), Ann. Int. Med. **28**: 309-451, 1948.

(2) greater knowledge of gold metabolism, its clinical effects and signs of toxicity; (3) better clinical and laboratory precautions, and (4) improved treatment of toxicity recently by means of 2,3-dimercaptopropanol (British antilewisite; BAL).

Prevention of Toxicity.—There is no reliable method for determining in which persons toxicity to gold salt will develop. Experience has shown that with reduction of weekly dosage of the gold compound the incidence of toxicity is reduced (table 5) and, what is even more important, the severity of reactions is less.[10] Efforts to lessen toxicity have led to the development of preparations of insoluble gold salts. Although toxicity is reported to be less with these salts, severe dermatitis, stomatitis and nephritis have occurred. When toxicity develops from insoluble gold salts it may persist or recur for as long as two and a half years because the material may remain at the site of injection, from which it is only slowly absorbed, for a long period. Consequently, insoluble gold salts are not recommended.

Precautions.—A physician need not be a specialist in arthritis to administer gold preparations, but only

TABLE 5.—*Incidence of Gold Toxicity in 126 Patients Treated with Gold Sodium Thiomalate in Different Doses*

Weekly Dose of Gold Sodium Thiomalate, Mg.	Incidence of Gold Toxicity, Percentage
100	41
50	30
25	18

TABLE 6.—*Dosage Schedule Recommended for Injections of a Soluble Gold Salt Containing 50 Per Cent Gold, Such as Aurothioglucose in Oil and Gold Sodium Thiomalate*

Intragluteal injections at weekly intervals	
First injection	10 mg. of the gold salt
Second injection	25 mg. of the gold salt
Third to sixteenth or twentieth injection	50 mg. of the gold salt
Further injections of 50 mg. on maintenance plan.	

those physicians who know the potentialities, are familiar with the manifestations of early toxicity and have the facilities for necessary laboratory control should attempt this form of therapy. The physician should see the patient before each injection to learn of any symptoms or signs of intolerance. Urinalysis for protein and sediment changes should be performed weekly; hemoglobin and leukocyte determinations should be made at least every two weeks. If indications of blood dyscrasia develop complete study of the blood and even bone marrow should be made.

Treatment of Toxicity.—Gold salt should be promptly discontinued and corrective measures employed when toxicity becomes apparent. The effectiveness of 2,3-dimercaptopropanol as an antidote for gold toxicity has been demonstrated by many investigators. If toxicity is severe, the antidote [10] should be administered as recommended for other heavy metal intoxications; the earlier it is used the more beneficial it is. Sometimes gold salt may again be tolerated following mild toxicity. After severe intoxication gold compounds should never be reemployed. Whether or not toxicity has occurred, gold therapy (after its use has been discontinued) should always be reinstituted with great caution and with small initial doses.

10. Freyberg, R. H.; Block, W. D., and Wells, G. S.: Gold Therapy for Rheumatoid Arthritis; Considerations Based upon Studies of the Metabolism of Gold, Clinics **1**: 537-570, 1942.

WHAT IS THE BEST METHOD OF USE OF GOLD SALTS?

Because of the long retention of gold in the body and because of its potential toxicity, it seems most reasonable to use the smallest amount consistent with good therapeutic results. This axiom accounts for the recent widespread use of smaller doses of gold salt than previously were employed.

Choice of the Gold Compounds.—In choosing the preparation to use as a therapeutic agent the knowledge of the metabolism of gold must be kept in mind. Colloidal preparations are generally inert, for the particles are quickly phagocytized. Insoluble salts are undependable and their behavior unpredictable. Although they may be less toxic, they have less advantage than disadvantage as therapeutic agents. A soluble gold salt such as aurothioglucose in oil or gold sodium thiomalate is recommended, to be injected into adults according to the schedule shown in table 6.

After 1 or 1.5 Gm. of the gold salt has been given, if improvement has not occurred therapy should be discontinued. If improvement has occurred, instead of giving courses of treatment separated by rest periods of three or four months it is now considered desirable to continue treatment less energetically for a prolonged period in an effort to reduce the incidence of relapse; injections of 50 mg. spaced at two week intervals are continued six to ten weeks, after which this dose is given at three week intervals for several months and, finally, monthly for six to twelve more injections (maintenance therapy). Although time has been insufficient for results to be analyzed statistically, this maintenance therapy appears to accomplish the purpose of lessening relapses. For children the dose of gold salt should be proportional to the body surface or weight.

Contraindications.—The chief contraindication to gold therapy is previous severe gold toxicity. Gold salts should be used with great care in persons who are known to have idiosyncrasy to other drugs or who have severe allergic disease. Pregnancy is not a contraindication, although usually the arthritis is so much improved during pregnancy that gold therapy is seldom considered. When another serious systemic illness exists it is best that it be cured or controlled before gold therapy is instituted for arthritis. Age is not a contraindication to use of gold compounds if function of vital organs and nutrition are good.

CAN IMPROVEMENTS BE EXPECTED?

It must be emphasized that when gold salts are beneficial improvement of the patient is not rapid. He should be forewarned that only after several months of gold therapy can he expect to note benefit and that many months of treatment may be required before there is improvement sufficient to decrease his disability. As is true with all other forms of therapy, use of gold salts is not complete treatment for rheumatoid arthritis; it is an adjunct to, not a substitute for, good general care.

Investigations with the objective to improve treatment for rheumatoid arthritis are increasing each year. Progress is being made. However, it seems unlikely that heavy metal therapy will be improved; rather, a different form of treatment may be developed which will

replace some current procedures. The recent knowledge of the great benefits to patients with rheumatoid arthritis from certain hormones, especially the adrenal cortical hormone, cortisone, and the pituitary adrenocorticotropic hormone, ACTH, is enthusiastically welcomed by everyone. The certainty, completeness and speed of the action of these new substances in controlling rheumatoid arthritis are remarkable. Patients and physicians throughout the world hope that use of these hormonal substances may soon become practical.

As therapeutic improvements develop they should be put into practice. An advertisement which appeared about 1880 characterized a rheumatic remedy as "better than gold." Now, seventy years later, it is hoped that cortisone will become the medicament which may be referred to as truly "better than gold" in the treatment of rheumatoid arthritis. When therapeutic procedures are developed that are more effective than gold salts, all physicians should abandon this form of treatment. Investigators who have been studying gold preparations will be among the first and happiest to discontinue the use of such compounds in favor of superior agents. Until improved therapy is available measures at hand must be employed. When gold salts are used, they should be given wisely with a full knowledge of their effects, limitations and potential toxicity as well as their potential benefits.

ABSTRACT OF DISCUSSION

DR. LESLIE J. A. PARR, Sidney, Australia: In 1936 in conjunction with Dr. E. A. Shipton of Australia, I began gold therapy, and in 1937 we published our first results—70 cases with 1 death, which occurred after we gave 200 mg. of a gold compound. At that stage, we reduced our dosage to 50 mg. Dr. Freyberg has detailed the most important facts concerning gold therapy and has stressed in particular dosage and maintenance dosage. We found early that results were as good with 50 mg. of a gold salt as with 200 mg. Although the improvement was slower, the toxicity went from 45 to 25 per cent, and that has been our average throughout the years. We have not observed any especially severe reactions. A number of exfoliative dermatitides responded rapidly to 2,3-dimercaptopropanol (BAL). Chrysotherapy was our main method of attack in rheumatoid arthritis until 1938, but we began to encounter so many relapses that we started giving a small maintenance dose of the gold salts at that period. In 1944 our patients were given a maintenance dose of 50 mg. once a week, later every second week, third week, fourth week and, finally, every six weeks. Some patients have gone four, five or six weeks on maintenance therapy with complete control of the disease and without relapse. We found that many cases of arthritis were refractory to gold therapy, and in consequence of some results with prontosil (diacetylaminoazotoluene), which the Germans investigated many years ago, we began looking for a sulfonamide preparation to supplement the action of gold, and we used benzyl sulfanilamide (proseptazine) in 1938. The war interrupted our work, and in 1943 we began more extended trials. Benzyl sulfanilamide is slightly different from all the other sulfonamide drugs, and today our method of procedure is, first, to attack the disease with benzyl sulfanilamide and then use a gold compound as a second method of attack. We find that benzyl sulfanilamide in conjunction with liver extract will give results much more rapid and spectacular than those with gold, and we have kept some of our patients on a benzyl sulfanilamide regimen for three years. We have had a 10 per cent rash-type reaction necessitating desensitization, but toxicity in many patients can be controlled with 1 to 1½ Gm. of benzyl sulfanilamide per day. Then we found that in some cases relapse of arthritic symptoms began during sulfonamide therapy, so we gave a gold compound in addition; today we give benzyl sulfonamide initially, and if the patient does not respond we may give a gold preparation. In the last eighteen months we have also used epinephrine and intravenously administered calcium. If one does not get any result using benzyl sulfanilamide within two months, I would advise trying the effect of epinephrine in oil. Some physicians will be amazed at the reaction that takes place. Since Dr. Thorn proved that epinephrine has some effect on the adrenal cortex, it may be that we were using the equivalent of small doses of adrenocortical hormones. That may be the explanation. We have found—and we have tried this over a period of ten years—that treatment with gold salts takes second place to benzyl sulfanilamide therapy in conjunction with epinephrine but that gold is still a valuable remedy. There are two important considerations, the small dosage and the maintenance dosage.

DR. RICHARD H. FREYBERG, New York: I have had no experience with the type of treatment discussed by Dr. Parr. Some physicians have felt that gold therapy has been of value because of the toxicity it produces and that it is desirable to produce toxicity to get the best result. I disagree. I am sure that good results can be obtained without producing toxicity.

ANTIHISTAMINIC AGENTS AND ASCORBIC ACID IN THE EARLY TREATMENT OF THE COMMON COLD

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and
HAROLD S. DIEHL, M.D.
Minneapolis

Recently there has been widespread interest in the use of antihistaminic drugs in the treatment of the common cold. Several enthusiastic papers have appeared in the medical literature. These reports have been widely publicized in the lay press, and, since some of the antihistaminic drugs have been released for over-the-counter sale, a tremendous advertising campaign has gotten under way.

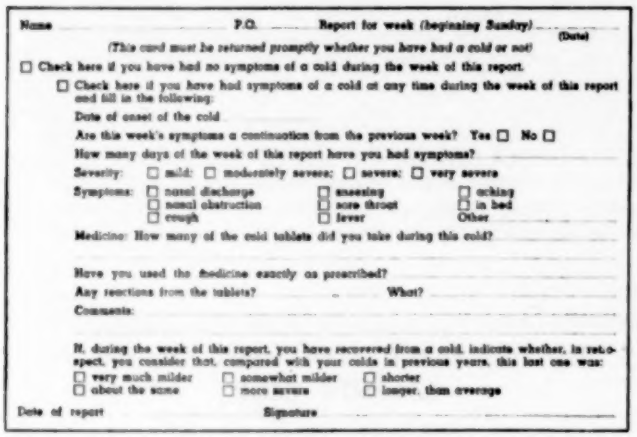
Brewster's reports [1] of 1947 and 1949 were on the use of diphenhydramine (benadryl®) hydrochloride, tripelennamine (pyribenzamine®) hydrochloride, pyranisamine maleate (neo-antergan®) and methapyrilene (histadyl® and thenylene®) hydrochloride. He was the first to emphasize the importance of the early use of these drugs in the treatment of the common cold. In his 1949 series, all symptoms were aborted in 19 of 21 patients who started medication within the first hour and in 48 of 55 patients who started medication within two hours of onset. One may reasonably ask how many of these patients actually would have continued to have symptoms if no treatment whatsoever had been given. His control series was inadequate to answer this question, since only 2 patients received the "control" (codeine-papaverine) medication during the first hour and none during the second hour of symptoms. Thus, it would appear from his graphs that, of all patients treated with either antihistaminic agents or codeine-papaverine during the first twelve hours of symptoms, only 9 per cent of the controls (2 patients) began treatment during the first two hours, while 20 per cent of the experimental group did so. When the graphs are referred to again and when only those colds treated after the symptoms had lasted at least two hours but before the cold was twelve hours old are considered, the results would appear to be as follows: of 215 patients receiving antihistaminic therapy, 111 (52 per cent) were "cured," 100 (46 per cent) were improved

From the Students' Health Service, University of Minnesota, Minneapolis.

1. Brewster, J. M.: Benadryl as Therapeutic Agent in Treatment of the Common Cold, U. S. Nav. Med. Bull. 47: 810 (Sept.-Oct.) 1947; Antihistaminic Drugs in the Therapy of the Common Cold, U. S. Nav. Med. Bull. 49: 1 (Jan.-Feb.) 1949.

and 4 (2 per cent) were not improved; of 20 patients receiving codeine-papaverine, 6 (30 per cent) were "cured," 11 (55 per cent) were improved and 3 (15 per cent) were not improved.

Gordon's report [2] of December 1948 concerned the use of diphenhydramine, tripelennamine and phenind-



Name ..... P.O. ..... Report for week (beginning Sunday) ..... (Date)

(This card must be returned promptly whether you have had a cold or not)

☐ Check here if you have had no symptoms of a cold during the week of this report.

☐ Check here if you have had symptoms of a cold at any time during the week of this report and fill in the following:

Date of onset of the cold .....

Are this week's symptoms a continuation from the previous week? Yes ☐ No ☐

How many days of the week of this report have you had symptoms? .....

Severity: ☐ mild; ☐ moderately severe; ☐ severe; ☐ very severe

Symptoms: ☐ nasal discharge ☐ sneezing ☐ aching
☐ nasal obstruction ☐ sore throat ☐ in bed
☐ cough ☐ fever Other .....

Medicine: How many of the cold tablets did you take during this cold? .....

Have you used the medicine exactly as prescribed? .....

Any reactions from the tablets? ..... What? .....

Comments: .....

If, during the week of this report, you have recovered from a cold, indicate whether, in retrospect, you consider that, compared with your colds in previous years, this last one was:

☐ very much milder ☐ somewhat milder ☐ shorter
☐ about the same ☐ more severe ☐ longer, than average

Date of report ..... Signature .....

Fig. 1. Card on which subjects reported the presence or absence of symptoms, the severity of symptoms and the effectivness of the medication during the week of the report.

amine tartrate (thephorin®) in the treatment of infections of the upper respiratory tract among 500 patients. He, too, was enthusiastic. Other forms of treatment were combined with the antihistaminic therapy in at least some of his patients, and he had no control series.

Murray [3] reported that tripelennamine produced more so-called cures and more relief from annoying symptoms of the common cold than any other treatment used in the medical department of the Dennison Manufacturing Company in the past twenty-eight years. His conclusions were based on an uncontrolled study in which he treated 510 patients with early head colds.

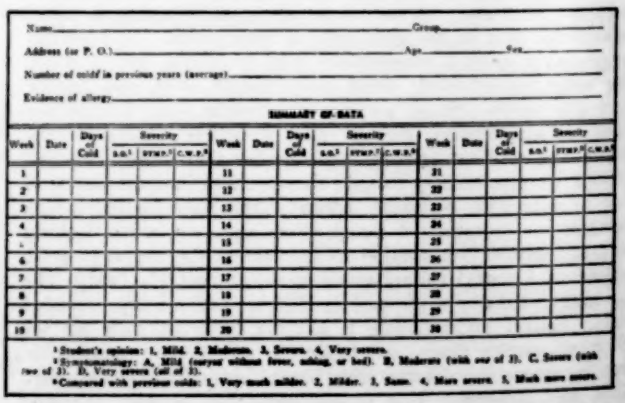
The most dramatic results were reported by Arminio and Sweet [4] in December 1949. They used thonzylamine (neohetramine®) hydrochloride in the prophylaxis and treatment of the common cold in three institutions—a large state penitentiary, a convent and a seminary. In the prophylaxis experiment, 300 patients took doses of thonzylamine hydrochloride every day over a period of about six months. At the same time, 300 control subjects took placebo tablets at the same rates. Of the former group, 200 took either 100 or 150 mg. of thonzylamine hydrochloride daily, and, of these, 91 per cent had no cold symptoms whatever during the entire period, 6.5 per cent had first phase colds lasting only twenty-four to forty-eight hours and only 2.5 per cent had second and third phase colds. One hundred subjects took 50 mg. of thonzylamine hydrochloride every day, and, of these, 83 per cent had no symptoms of colds during the entire period, 5 per cent had first phase colds and 12 per cent had second and third phase colds. In not one of the 300 patients taking thonzylamine regularly did cough, malaise, nasal obstruction or fever develop over the entire six month period. Reactions to thonzylamine were practically nonexistent: mild reactions developed in 11 of the 100 subjects who took 150 mg. per day, but none of the other 200 subjects taking thonzylamine complained of any ill effects whatever. Among the 300 control subjects, 241 had one or more colds—some as many as five or six; 179 of these were severe colds and "practically all eventually required extensive therapy"; complications such as pneumonitis, bronchitis and sinusitis, developed in 11 subjects.

The treatment group reported by Arminio and Sweet contained over 300 patients. One third of these received 50 mg. of thonzylamine hydrochloride three times a day for three days, another third received the placebo medication and the rest received the usual cold treatment (acetylsalicylic acid, nose drops and lozenges). It was noted that 100 per cent of the subjects who began thonzylamine treatment during the first forty-eight hours after the onset of symptoms responded to therapy. This treatment, when begun within the first twenty-four hours, relieved colds in one-fifth the time, as compared with the placebo series, and, if the drug was given during the second twenty-four hours, the time required for complete relief was reduced by half, as compared with the placebo series. It was pointed out that thonzylamine is of no value once there has been secondary invasion.

Phillips and Fishbein [5] used caubren® compound (25 mg. chlorothen citrate, 320 mg. acetophenetidin and 32 mg. caffeine) for the treatment of colds in an industrial plant. They controlled their experiment by giving acetylsalicylic acid tablets to about an equal number of subjects. The average duration of the colds was about half as long for the group given the caubren® compound as for the group given acetylsalicylic acid, and again these authors point out that the earlier the antihistaminic therapy is begun, the better. Reactions were more frequent among those taking acetylsalicylic acid than in the experimental group.

OUTLINE OF PRESENT STUDY

In the fall of 1948, we began a controlled experiment in an attempt to evaluate the antihistaminic agents as a method of treatment of the common cold. We were



Name ..... Group .....

Address (or P. O.) ..... Age ..... Sex .....

Number of colds in previous years (average) .....

Evidence of allergy .....

SUMMARY OF DATA

Week	Date	Days of Cold	Severity			Week	Date	Days of Cold	Severity			Week	Date	Days of Cold	Severity		
			S.O.[1]	SYMP.[2]	C.W.S.[3]				S.O.[1]	SYMP.[2]	C.W.S.[3]				S.O.[1]	SYMP.[2]	C.W.S.[3]
1						11						21					
2						12						22					
3						13						23					
4						14						24					
5						15						25					
6						16						26					
7						17						27					
8						18						28					
9						19						29					
10						20						30					

[1] Student's opinion: 1, Mild. 2, Moderate. 3, Severe. 4, Very severe.
[2] Symptomatology: A, Mild (never without fever, aching, or bed). B, Moderate (with one of 3). C, Severe (with two of 3). D, Very severe (all of 3).
[3] Compared with previous colds: 1, Very much milder. 2, Milder. 3, Same. 4, More severe. 5, Much more severe.

Fig. 2.—Individual master sheet for each student, on which weekly information from each subject on cold prevention in 1948-1949 was summarized.

interested, also, in trying large doses of ascorbic acid, since one of our earlier experiments [6] indicated a possible (though slight) effect of this substance in the prevention of colds.

2. Gordon, J. S.: Antihistaminic Drugs in the Treatment of Upper Respiratory Tract Infection, Laryngoscope **58**: 1265 (Dec.) 1948.

3. Murray, H. G.: The Treatment of Head Colds with an Antihistaminic Drug, Indust. Med. **18**: 215 (May) 1949.

4. Arminio, J. J., and Sweet, C. C.: The Prophylaxis and Treatment of the Common Cold with Neobetramine, Indust. Med. **18**: 509 (Dec.) 1949.

5. Phillips, W. F. P., and Fishbein, W. I.: An Antihistaminic Analgesic Preparation in the Therapy of Colds, Indust. Med. **18**: 526 (Dec.) 1949.

6. Cowan, D. W.; Diehl, H. S., and Baker, A. B.: Vitamins for the Prevention of Colds, J. A. M. A. **120**: 1268 (Dec. 19) 1942.

We had intended to make this a two year study, but, because the antihistaminic drugs have now been released for over-the-counter sale, it is obvious that some difficulty might be encountered in keeping the control group strictly controlled; therefore, we are reporting the relatively small series observed during the school year 1948-1949, before antihistaminic drugs were available without prescription.

The subjects were University of Minnesota students who volunteered to join the group because they were especially susceptible to colds and because colds constituted a real problem to them. On enrolment in the group, each subject was asked to fill out a questionnaire. Then, after a brief discussion, he was given a box of medicine with written instructions to take one dose at the first symptoms of a cold and to repeat the dose every four hours until the cold was definitely "cured" or until the medicine (10 doses) was used up. The medicaments were given out in strict rotation to the students as they enrolled, as follows[7]: group 1—placebo (citric acid to simulate the taste of ascorbic acid, lactose, cornstarch, sugar, talc and stearic acid); group 2—ascorbic acid, 667 mg., plus the binders and fillers previously mentioned; group 3—phenindamine tartrate, 25 mg., plus citric acid, lactose and binders; group 4—ascorbic acid, 667 mg., plus phenindamine tartrate, 25 mg., plus binders, and group 5—tripelennamine hydrochloride, 50 mg., plus citric acid and binders, in special large white tablets to look like the others. Each subject was instructed to return for more of his medicament whenever needed so that it would always be available for the early treatment of any cold that might occur.

Each week the subject received a report card (fig. 1) for reporting the presence or absence of symptoms during the week of the report, the severity of symptoms and the effectiveness of the medication. These weekly reports were summarized on a master card (fig. 2) for each student, and the data from the master cards were used to tabulate the results of the entire study.

Of the 430 subjects enrolled at the beginning of the study, the records of 367 (85.4 per cent) were used in tabulating the final results. These 367 students treated 980 colds during the period of the study (December 1948 to April 1949). The reasons for dropping the other students were as follows: 1. It was found during the course of the study that 12 enrollees were definitely allergic, although, by questioning each applicant as he applied, we had tried to keep out of the group all those whose colds were probably allergic in nature. These 12 were referred to an allergy clinic for study and treatment. 2. Twenty-five students failed to send in their

TABLE 1.—*Antihistaminic Drugs and Ascorbic Acid in Treatment of Colds*

	Group 1 (Placebo)	Group 2 (Ascorbic Acid)	Group 3 (Phenindamine Tartrate)	Group 4 (Ascorbic Acid plus Phenindamine Tartrate)	Group 5 (Tripelennamine Hydrochloride)
Number of subjects in group at completion of study	76	77	73	71	70
Average number of colds per year in previous years *	5.4	5.6	5.2	5.1	5.2
Total number of colds treated in study	267	213	198	172	190
Average duration of colds in previous years (days) *	13.0	12.2	11.5	10.8	13.0
Average duration of colds treated in this study (days)	5.1	5.6	5.7	5.6	5.2
Percentage of "reduction" in duration	61	54	50	48	60
Number of patients reporting reactions	7 (9%)	7 (9%)	12 (16%)	13 (18%)	13 (19%)

* Reported from memory.

TABLE 2.—*Severity of Treated Colds in This Study (Percentage of Total Colds in Group)*

	Group 1 (Placebo)	Group 2 (Ascorbic Acid)	Group 3 (Phenindamine Tartrate)	Group 4 (Ascorbic Acid plus Phenindamine Tartrate)	Group 5 (Tripelennamine Hydrochloride)
1. Student's opinion as to severity					
Mild	54	51	49	48	57
Moderate	28	26	35	35	30
Severe	13	19	11	12	11
Very severe	5	4	5	5	2
2. Based on symptoms *					
Mild	75	72	73	69	78
Moderate	19	18	16	25	17
Severe	4	8	8	5	3
Very severe	2	2	3	1	2
3. Student's opinion as to comparison with previous colds					
Much milder	42	40	35	34	37
Somewhat milder	33	32	38	33	32
About the same	17	20	18	22	25
More severe	8	8	9	11	6
Shorter	27	23	28	28	35
Longer	4	6	5	7	4
Presumably neither shorter nor longer than usual	69	69	67	65	61
4. Percentage of colds lasting less than 4 days	47	39	44	43	45
5. Percentage of colds lasting only 1 or 2 days	33	25	25	24	29

* See text for basis of classification

7. The special tripelennamine hydrochloride tablets were furnished by Ciba Pharmaceutical Products, Inc., Summit, N. J. The other preparations, including the placebo, were furnished by Hoffmann-LaRoche, Inc., Nutley, N. J.

reports, either because of cancellation from school or failure to cooperate. 3. Twenty-four students reporting regularly had no colds during the entire period of the study and, therefore, had no opportunity to try the medicine given them. 4. Two students refused to continue to take the medicine because of "reactions." One of these complained only of the bad taste of the tablet (tripelennamine), and the other became weak and dizzy on each of two attempts to take the medicament (phenindamine). In our series (table 1), the antihistaminic agents alone, ascorbic acid alone, or phenindamine plus ascorbic acid did not shorten the average duration of colds in their groups of subjects. It is emphasized that all students were instructed to start the medication at the earliest symptom. Some students no doubt waited for several hours to begin medication, but we have no reason to believe that the time interval factor would not have operated the same for all groups, including the group taking placebo.

It is interesting that 7 of the subjects taking placebo reported "reactions." Two reported headache from the placebo tablets (1 stated that it occurred every time he took the medicament); 2 reported a mild sedative effect; 1 reported increased frequency of urination; 1 reported nausea, and 1 reported angioneurotic edema of the lip. Seven patients in the group taking ascorbic acid also reported reactions: dryness of the mouth, 2; increased frequency of urination, 1; nausea, 1; headache, 1; sleeplessness, 1, and "bad taste," 1. Phenindamine caused the following reactions in 12 patients: stomach upset, 4; headache, 3; sleeplessness, 2; "dopey" feeling, 1; dizziness, 1, and difficult and painful urination, 1. In addition, it will be remembered that 1 patient dropped out of the study because of severe dizziness and fainting after taking phenindamine. Reactions to the ascorbic acid and phenindamine combination occurred in 13 patients: headache alone, 2; headache, sleepiness and loss of appetite, 1; drowsiness, 3; sleeplessness, 2; dizziness, 2; excessive perspiration, 1; increased frequency of urination, 1, and slight weakness and faintness, 1. The reactions to tripelennamine in 13 patients were: drowsiness alone, 6; dizziness alone, 2; dizziness and drowsiness, 1; dizziness and headache, 1; stomach irritation, 1; increased frequency of urination, 1, and sleeplessness, 1. In addition, 1 subject refused to continue the experiment because of the bad taste of the tripelennamine hydrochloride tablets.

Table 2 represents an attempt to compare the relative severity of the treated colds in each of the five groups. This is presented in five different ways: 1. The student's own opinion as to the severity of his symptoms. 2. Our estimate, based on the symptoms checked on the report card by the student; this classification was (*a*) mild if there was coryza but no fever and no aching and the patient did not have to go to bed with the cold, (*b*) moderate if either fever or aching was present or bed rest was required, (*c*) severe if two of these criteria were met and (*d*) very severe if all three of these criteria were met. 3. Comparison with previous colds (student's opinion): after the cold was completely over, the subject was asked to tell whether he thought it had been much milder, somewhat milder, about the same, or more severe and whether it had been shorter or longer than the usual previous colds. 4. The proportion of all colds in each group which lasted less than four days each. 5. The proportion of colds in each group which lasted less than three days. None of these comparisons indicates that any of the experimental groups fared better than the control group.

We received many enthusiastic reports, both written and oral, from the subjects of the cold study. However, some of the most glowing testimonials came from members of the control group. The first request we received this fall concerning information on the availability of our "cold pills" came from a student who had been in the study series and who had since been graduated. We answered that the material was not yet available commercially in the form administered here but that we still had some in stock and would give him some, if he liked. He made a special trip from the northern part of the state to get the drug, whereupon it became necessary for us to look up his record. He had been in the placebo group.

SUMMARY

Under the conditions of this controlled study, in which 980 colds were treated in 367 supposedly nonallergic students, there is no indication that ascorbic acid alone, phenindamine tartrate (thephorin®) alone, ascorbic acid plus phenindamine, or tripelennamine (pyribenzamine®) hydrochloride have any important effect on the duration or severity of these infections of the upper respiratory tract.

ORALLY GIVEN MEPHENESIN IN INFANTILE CEREBRAL PALSY

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Grand Rapids, Mich.

The treatment of cerebral palsy at the present time centers about muscle relaxation and reeducation. The modalities employed in training a child are well defined and are executed in specific phases during the progress of a patient. The training period is long and tedious and may well be compared in chronicity to the educational program of a normal child in his primary school. Surgical procedures, external bracing and medication are considered adjuncts only.

Many children manifesting the various types of cerebral palsy have been subjected to the administration of barbiturates, belladonna, scopolamine, stramonium, neostigmine and other preparations in the hope of release from the abnormal state. The results over a long period of time have been variable if not indifferent.

A definite aid in treatment might be a nontoxic drug with few or no undesirable effects. Such a preparation should be palatable to children. It should produce the desired degree of relaxations or stability for a sufficient period of time to allow a child to acquire new motor patterns or to perfect existing ones. The recent reports on the effect of mephenesin (tolserol®[3-ortho-toloxy-1,2-propanediol]) in spastic and athetoid states are interesting and suggest that this drug may be a precursor of progressive developments in this field of therapy.

The British pharmacologists Berger and Bradley found that mephenesin produced muscle relaxation without unconsciousness. Stimulated by their observations Stephen and Chandy,[1] Schlesinger and others[2]

Mephenesin (tolserol®) for this study was supplied by E. R. Squibb & Sons.

1. Stephen, C. R., and Chandy, J.: Canad. M. A. J. **57**:463 (Nov.) 1941.

2. Schlesinger, E. B.; Drew, A. L., and Wood, B.: Clinical Studies in the Use of Myanesin, Am. J. Med. **4**:365 (March) 1948.

and Gammon and Churchill [3] observed the clinical effects in human beings. Initial observations were made by use of preparations intravenously. Suppression or complete alleviation of choreoathetotic states and diminished spasticity were noted. These results were accomplished within a safe therapeutic range.

Undesirable effects noted during intravenous injections were nystagmus, circumoral numbness, blurred vision, oral dryness, corneal injection, muscular incoordination, drowsiness and slight decrease in systolic blood pressure. These phenomena promptly disappeared when administration of the drug was stopped. The beneficial effects were also transitory. The brief period of rendering the abnormal neuromuscular mechanisms quiescent by the intravenous route limits the practical value.

Gammon and Churchill noted moderate relief in parkinsonism with oral medication of 2 to 3 Gm. doses. They are able to demonstrate a reduction in spasticity in a postencephalitic quadriplegic patient by hourly doses of 2 Gm. through a two week period. Two of their subjects demonstrated a white blood cell count of 3,000 after large doses.

Berger and Schwartz [4] administered mephenesin orally in a palatable vehicle with apparently satisfactory results in certain cases of cerebral diplegia and choreiform movements. They concluded that oral medication produced most of the beneficial effects observed after intravenous injection. The drug seemed to be well tolerated over many weeks.

At present it is thought that the major therapeutic effects are the result of a differential depression of the basal ganglia, thalamus and brain stem. From these studies no severe toxic symptoms have been observed. The exact mode of breakdown or conjugation of mephenesin is not specifically known. In part it may be conjugated with glucuronic acid. Plasma levels in dogs have been carefully measured, and ninety minutes after injection no free mephenesin could be detected in the blood stream. The output of free mephenesin parallels the conjugation of the drug in the plasma. Berger and Schwartz [4] could demonstrate the metabolic products in the urine as early as fifteen minutes after oral administration. Wyngaarden, Woods and Seevers [5] measured the output in dogs and found that the greatest amount of excretion occurs in three to four hours. Up to 42 per cent of the drug is excreted in the first twenty-four hours.

CLINICAL MATERIAL

These observations stimulated me to attempt an evaluation of the drug in a carefully controlled group of children afflicted with several types of cerebral palsy. Twenty-seven patients ranging from 3 to 21 years of age were selected.[6] These children were given mephenesin in tablet form (one tablet contains 250 mg. of the drug). The severity varied from moderate manifestations in ambulant children to severe involvement in nonambulant patients. None had hearing defects. Five wore corrective glasses. Speech involvement varied from incoherent vocalization, slow labored word formation and reversed breathing to normal. Periodic notes were kept by room teachers, physical and occupational therapists and speech correctionists. Parents were requested to note any change in motor venture accomplishment at home plus changes in behavior and general demeanor. From time to time at short intervals administration of the drug was temporarily discontinued in a number of subjects. The accompanying table details the cases as classified in clinical charts.

DOSAGE

Four doses of mephenesin a day were given, twenty minutes before meals and one-half hour prior to retiring. Children under 10 years of age were given 1 Gm. a day initially as four tablets (1-1-1-1). Children over 10 years of age were started at 1.5 Gm. as six tablets (2-2-1-1). From five days to a week the dose was increased by adding one (or more) tablet per meal. Thereafter, monthly, the dosage was increased to tolerance as determined by vertigo or other undesirable effects, i. e., six (2-2-1-1) to seven (2-2-2-1) or eight (3-2-2-1) tablets. The average doses over a prolonged period of time were between 0.75 and 3 Gm. The tolerance in general was governed by the size of the child. Those under 10 years of age averaged 1.5 Gm. Many children over 10 years of age could take 3 Gm. without side effects. For example, a 6½ year old athetoid child weighing 28 pounds (12.7 Kg.) could take only 1 Gm. in four doses per day. An 11 year old spastic quadriplegic child weighing 57 pounds (25.9 Kg.) handled with ease 2 Gm. A 15 year old child with tension athetosis who weighed 105 pounds (47.6 Kg.) tolerated 2.5 Gm. Sex did not make any appreciable difference in dose toleration. Not appreciated initially in the program was the bedtime dose. It was observed by some parents after a month that sleeping habits of the children were improved. Morning vertigo was controlled by a decrease in the breakfast dosage and an increase in the noon dosage.

Clinical Status of Twenty-Seven Patients Given Mephenesin

Spasticity	
Quadriplegic	4
Paraplegic	3
Hemiplegic	1
Athetosis, nontension	5
Athetosis, tension	11
Rigidity	3
Total	27

EXCRETORY AND BLOOD STUDIES

Eight children were followed for two weeks by daily urine examinations. The specimens were taken approximately one hour after the noon dose. Ehrlich's diazo reagent was employed for coloration values. All children had 2 plus to 4 plus elimination values during the first week. Mephenesin was discontinued Sunday night of the first week; urine tests were continued each day for seven successive days. The urine of 7 children did not contain the drug at seventy-two hours. The urine of 1 child contained a trace up to the fourth day. The blood cell counts of these children were determined throughout the program up to seven months. No appreciable changes in red blood cells or hemoglobin content or variations in the white blood cells were noted.

UNDESIRABLE EFFECTS

Vertigo was experienced by most children when mephenesin was first given. At the initial dosage level this phenomenon was transient. It appeared at subse-

3. Gammon, G. D., and Churchill, J. A.: Effects of Myanesin upon the Central Nervous System, Am. J. M. Sc. **217**: 142 (Feb.) 1949.
4. Berger, F. M., and Schwartz, R. P.: Oral "Myanesin" in Treatment of Spastic and Hyperkinetic Disorders, J. A. M. A. **137**: 772 (June 26) 1948.
5. Wyngaarden, J. B.; Woods, L. A., and Seevers, M. H.: Plasma Levels and Urinary Excretion of Injected Myanesin in Dogs, Proc. Soc. Exper. Biol. & Med. **66**: 256 (Oct.) 1947.
6. From the Orthopedic Clinic, Blodgett Memorial Hospital, the Junior League Cerebral Palsy Nursery School, the Orthopedic School and the Mary Free Bed In-Patient Cerebral Palsy Unit.

quent increases in dosage, more often after the morning dose. One 60 pound (27.2 Kg.) 8 year old child with tension athetosis did well on 1 Gm. with little or no vertigo. His time distance factor in walking improved. His arms relaxed. At a dosage of 1.5 Gm. he experienced moderate dizziness sufficient to interfere with ambulation. Decreasing the dosage to 1 Gm. did not alleviate the vertigo—his treatment with the drug was discontinued after fifty-five days.

Nausea and vomiting was produced by a 1 Gm. dose in a spastic quadriplegic child. Treatment was discontinued at the end of two weeks. Irritability developed in 2 children. A spastic quadriplegic child 13 years of age seemed to be excited and cried continually. Administration of the drug was stopped after two weeks. An 8 year old atypical (shudder) athetoid boy receiving 1 Gm. per day seemed to have less thrust to his athetosis, and his speech, though unintelligible, required less effort and was less explosive. The dose was increased to 1.5 Gm. one month later, which excited the boy to almost clonic convulsive movements. Administration was stopped, and the child would not take the drug again. We have no satisfactory explanation for this reaction.

In 2 children the undesirable reaction of listlessness developed while they were receiving dosages insufficient to demonstrate desirable effects. There were 5 complete failures. One child did not return at regular intervals to permit evaluation of results. Four children (14 per cent) could not tolerate the drug in sufficient dosage to produce objective beneficial effects. In these 4 instances treatment was discontinued four days to two weeks after it was begun.

BENEFICIAL EFFECTS

Spasticity.—Of 8 spastic children, 2 did not tolerate the drug. The remaining 6 subjects, over a period varying from two to seven months, did not demonstrate sufficient objective improvement in speech, self help, ambulation or personal appearance to justify a continuation of the drug. One paraplegic boy aged 20 wished to continue receiving the drug and at the time of writing is still taking 2 Gm. per day. He stated, "I feel better and think that my stride is longer, without so much effort."

Rigidity.—Three children (3, 5 and 5 years of age) demonstrated no changes in rigidity to the therapists or parents. Administration of the drug was stopped in these children after sixty days.

Athetosis.—Nontension: Five children were classified as having nontension athetosis. Three of these subjects demonstrated improvement to the speech therapist. Lip movements were of less amplitude, and word formation was more distinct. Tongue control seemed to be easier. No change in breathing problems were noted. One of these, a boy aged 15, had less overflow in his arms when walking. A second of these 3 was less restless in school; his attention span was increased, as observed by his room teacher. After this child, aged 8½, had received the drug for one month he was able to have his hair cut without someone's holding his head, for the first time in his life. The remaining 2 children did not demonstrate satisfactory objective improvement to the staff.

Tension: Eleven children with tension athetosis demonstrated some improvement in the four fields of total motor function.

Speech. Seven children were noted to expend less effort in lip placement. The time element in forming words was less. Tongue placement seemed easier. One child demonstrated a decrease in tremor of the tongue. Word formation in general was clearer and more understandable to the grade room teacher.

Self help. Nine children demonstrated less tension in muscles of the shoulder and arm groups. The small muscles of the hand were more relaxed, and the release mechanism from grasp was more easily accomplished. A 10½ year old boy and a 20 year old girl obtained pronation-supination improvement sufficient to use a screw driver and turn faucets. The girl learned to handle and cut with dressmaking scissors.

Gait. Little change in gait was noted except in 2 children. Four of the children were nonambulant at the initiation of the program and did not make appreciable gains during the trial period. One boy increased his time-distance factor by 50 per cent but demonstrated no improvement in rhythm or grace while walking. A 20 year old girl learned heel-toe gait and exerted less effort in walking. She secured control sufficient to operate the foot treadle on an old-fashioned sewing machine.

Personal appearance. Three younger girls, 3½, 6 and 6½ years of age, with speech defects, grimaced less in speech effort. Pursing the lips was easier. The child aged 3½ years demonstrated no change in her drooling.

Sleeping habits improved in 4 children, 8 years of age and younger. They stretched out in bed and did not roll or toss. One older boy offered the statement that he "slept like a log."

COMMENT

The general opinion of the staff was that there was more consistent improvement in the subjects with tension athetosis. Children over 10 years of age seemed to respond better than the younger subjects. In the over 10 age group hand skills, which one would expect to be well developed in the normal child, seemed to improve with mephenesin therapy. Paradoxically, however, balance and gait did not seem to parallel the upper extremity gain. It was the opinion of the speech instructor and physical and occupational therapists that the drug certainly deserves a trial in the athetoid group.

SUMMARY

1. Orally given mephenesin (tolserol®) was well tolerated over a seven month period in 23 children (86 per cent) of a test group of 27 subjects with infantile cerebral palsy.

2. No undesirable results were manifest in blood and urine studies.

3. Vertigo, nausea, vomiting, irritability and listlessness were undesirable side effects noted in children receiving doses up to 2 Gm. Vertigo was in most cases easily controlled by change in dosage.

4. Children with spasticity and rigidity did not respond satisfactorily in the group evaluated. (They constituted 38.2 per cent of children tolerating the drug.)

5. Of 16 athetoid children, 14 demonstrated beneficial effects (87 per cent). (They constituted 60.8 per cent of the 23 children tolerating the drug.) Children with tension athetosis seem to have a favorable response to mephenesin more consistently than other groups.

Clinical Notes, Suggestions and New Instruments

MURAL BACTERIAL ENDOCARDITIS PRODUCED BY PROTEUS

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The Proteus organisms are widely distributed in nature, and in their ubiquity and activity they probably rank second only to the cocci. They are commonly found in garden soil, on vegetables and rotten meat and in sewage. A high percentage of normal stools are found to contain the organisms. For many years after the isolation of the Proteus in 1885 by Hausser they were thought to be simple harmless saprophytes, though reports of human infections appeared periodically and continuously thereafter in the literature. Most observers now believe that, although the organisms are saprophytes, they are potential pathogens or opportunists, for in certain favorable circumstances they can produce severe local lesions and even fatal disease processes. From time to time the organisms have been implicated in a variety of pathologic conditions such as acute enteritis, food poisoning, war wounds, urinary tract infections, meningitis in newborn infants, chronic otitis media and secondary meningitis and abscess of the brain, and septicemia.

The following case of pure mural bacterial endocarditis is of interest because the isolated organism was an unusual strain of Proteus. Furthermore, the vegetation was confined to the endocardium without involving the valve leaflets.

REPORT OF CASE

Mrs. R. B., a woman aged 55, was admitted to the hospital Nov. 5, 1948 with recurrent, severe shaking chills and fever of several weeks' duration. The chills occurred about every three to six days and lasted six to eight hours with accompanying fever (103 to 104 F.). During the period of remissions, the temperature was within normal limits and the patient was fairly comfortable. For several years she had experienced moderate dyspnea on exertion and was known to have a cardiac disability.

An electrocardiogram taken on admission showed auricular fibrillation, and a roentgenogram of the chest revealed enlargement of the right side of the heart without parenchymatous change in the lungs. Intravenous pyelogram and retrograde pyelograms revealed essentially normal conditions. A urine specimen obtained by cystoscopy showed many red and white blood cells and numerous gram-negative bacilli. The serum agglutination tests were negative for typhoid, paratyphoid, Brucella abortus and Proteus OX^{19}. Malarial parasites were not seen in the blood smears on three separate occasions. The range of the hemogram, taken at various periods during the course of the disease, was: hemoglobin 58 to 61 per cent, red blood cells 2.84 to 3.08 millions and white blood cells 14,500 to 20,200 per cubic millimeter, stab neutrophils 5 to 14 per cent, segmented neutrophils 65 to 83 per cent, lymphocytes 8 to 22 per cent, monocytes 1 to 5 per cent and eosinophils 0 to 2 per cent. Blood cultures made after the chills on three separate days were all positive for Proteus organisms.

The septicemia, with its chills and fever, was uncontrolled by penicillin or streptomycin, and after a period of auricular fibrillation the patient suddenly expired Dec. 1, 1948, with symptoms of cerebral embolism.

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Dr. W. A. D. Anderson, professor of pathology, Marquette University School of Medicine, assisted in the study and preparation of this case report.

AUTOPSY

At autopsy an enlarged heart (400 Gm.) with mitral stenosis was found. The mitral valve was thickened and typically funnel-shaped: the atrium was decidedly dilated. A large fungating vegetative growth which was grayish brown, soft and friable filled the left auricle and extended to the lateral wall of the atrium. The valve was uninvolved by the vegetation. The pertinent observations in the other organs were those of embolic phenomena. Petechial hemorrhages and focal scarring were noted in the kidneys. The spleen was soft and bulging; it contained multiple large abscesses filled with purulent material. Pure cultures of an organism identical to that obtained from the blood stream while the patient was alive were grown from the vegetation in the heart and from the splenic abscesses.

The isolated organisms, although belonging to the Proteus group, differed from the usual strains of the organism in producing hydrogen sulfide.[1]

Microscopically the vegetation in the heart consisted of a mass of hyalinized fibrin and platelets interspersed by round cells, polymorphonuclear leukocytes and innumerable bacilli. In many areas the organisms were aggregated in large clumps. Portions of the vegetation were relatively fresh, as the fibrin was loose and the entrapped erythrocytes and leukocytes appeared well preserved. The fibrous base of the vegetation, which merged with the underlying endocardium, contained fresh and old hemorrhages, small deposits of calcium and a scattering of lymphocytes and plasma cells. The myocardium was degenerated, and its muscle bundles were separated by edema and interstitial fibrosis.

In the spleen multiple large and small purulent abscesses were seen. The larger lesions were walled off by fibrous connective tissue, but the others were poorly encapsulated. A few clumps of bacteria were present in some areas. The surrounding pulp was hemorrhagic, edematous and infiltrated by many plasma cells and polymorphonuclear leukocytes.

In the kidneys cloudy swelling and patchy areas of hyaline droplet degeneration were seen. Several of the tubules were filled with granular casts, and an occasional vessel contained bacterial organisms. Patches of scarring were present in the subcapsular area. In a number of the glomeruli focal hyaline lesions, representing the so-called focal embolic glomerulonephritis, were noted.

No unusual features were observed in the liver, spleen, pancreas or adrenals. The lungs had areas of atelectasis and emphysema and foci of mild leukocytic infiltration.

COMMENT

Pure mural bacterial endocarditis with vegetation confined to the endocardium without involving the valve is relatively uncommon. The predisposing factor in this case was apparently the presence of mitral stenosis. The portal of entry of the organism was not determinable.

Although bacterial endocarditis is a common occurrence and has been produced by a wide variety of organisms, that caused by the Proteus is unusual and rare. Furthermore, the organism isolated in this case was an unusual strain, differing from the established types by producing hydrogen sulfide. In view of the fact that the Proteus is ordinarily considered a saprophyte, it seems that practically every type of bacterial organism in favorable circumstances can produce endocarditis. There is little doubt that Proteus organisms are potential pathogens and that they can produce severe and even fatal disease processes.

Focal glomerular lesions consisting of hyaline thrombi, such as are commonly associated with bacterial endocarditis, were found in this case. For these lesions the term focal embolic glomerulonephritis has been used, with the implication that the lesions are produced by showers of minute emboli liberated from the cardiac vegetation which lodge and damage glomerular tufts. That this is the mechanism of pathogenesis of the renal lesion has been questioned.

1. Studies made on the cultures by the Laboratory of the United States Public Health Service and the Enteric Center in Copenhagen, Denmark, brought a similar conclusion. Full details of the bacteriologic studies of the organism are being published in another paper.

CONCLUSION

A case of pure mural bacterial endocarditis produced by a new strain of Proteus is reported. The vegetative growth was confined to the endocardium of the left atrium without involving the mitral valve.

5000 West Chambers Street.

TOXIC PSYCHOSIS DUE TO PROPHENPYRIDAMINE (TRIMETON®)

Report of a Case

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The following case report is submitted as an example of a toxic reaction to an antihistaminic drug, prophenpyridamine (trimeton®). Although toxic symptoms ascribed to the reaction of the central nervous system to prophenpyridamine (drowsiness, nervousness, listlessness, dizziness, irritability and even mild transient amnesia) have been described in recent papers in the literature,[1] so far as we can determine a case of a major toxic psychosis has not been reported up to the present time.

REPORT OF A CASE

C. P., an 18 year old white Catholic youth, was admitted to the Grasslands Psychiatric Institute on the recommendation of the family physician on Thursday night, Sept. 1, 1949. The patient had been seen in consultation with a psychiatrist, who made a presumptive diagnosis of schizophrenia and advised immediate hospitalization.

The patient's birth and development had followed a normal course. He had not been subject to any neurotic traits of childhood such as nail biting, enuresis or tantrums. His relationship with his parents and the only other sibling, a sister two years his senior, had been free from significant conflicts. The patient graduated from high school in the spring of 1949. His school work was good. He displayed mechanical aptness, was rather shy and uncomfortable in a mixed group and preferred hunting and farming to social contacts. His major interest was farming. He had enrolled in an agricultural institute for the fall of 1949. He spent the summer of 1949 employed as a cadet farmer in upstate New York, where he was working from July 1 until the onset of his present illness.

The patient was robust, seldom ill and subject only to an allergic rhinitis, which became more distressing on the farm. At the beginning of the summer prophenpyridamine tablets, 25 mg. three times a day, were prescribed for his allergic symptoms. Over a two month period the patient ingested 200 such tablets until the onset of the presenting illness. Although he had been working hard on the farm and had lost a total of 35 pounds (15.9 Kg.) in weight during the month of August, he remained apparently well until the last week of that month. On Aug. 26, 1949, the patient's farm employer called the parents, informed them that their son had become "very nervous" and urged them to take him home as soon as possible. The parents were told that the patient had heard that a small forest fire had started somewhere in the vicinity of the farm, that he had set out alone on foot to locate the fire and was found hours later a few miles away, exhausted, nervous and speaking irrationally. The patient's mother and sister took him home by car to Westchester County. En route his behavior was bizarre. At first he insisted on driving at a speed of 20 miles per hour on the open highway because "things were moving too fast and everybody is tired." He stopped the car many times for gasoline although little was needed each time. After his mother finally took the wheel of the car and he was relegated to the back seat, he was heard muttering to himself, intermittently singing and sobbing violently. During the two days at home prior to his admission to Grasslands Psychiatric Institute the patient's behavior continued bizarre. Although he was not mentally confused or disoriented, he was exceedingly irritable, talkative and restless. He wandered about rather aimlessly and exhibited great concern over trivial matters in the household.

A psychiatric examination disclosed a husky adolescent boy who was obviously lethargic and mentally confused. He had difficulty keeping his head up or his eyes open and slouched in his chair in an awkward position. Immediate contact was poor, and the patient struggled to attend to the interview. In general, psychomotor activity was much retarded. Stream of speech was slowed, irrelevant and circumstantial; he did not reach thought goals, and disturbed thinking was evident. For example, when asked what brought him to the hospital, the patient replied: "The wind . . . no, not the wind. The wind is in Florida. It's cold up here. Don't worry. Take it easy. You will be all right." He was not depressed. Emotional reactions were obviously inappropriate. The patient smiled and laughed quietly out of context. No abnormal preoccupations such as delusions or hallucinations were elicited. The patient was oriented as to date, place and time. Active attention and span of attention were moderately impaired. General grasp and recall showed marked impairment, as indicated by the poor performance on the "cowboy story." A significant loss of the capacity for abstract thinking was evident. Recent and remote recall were intact, and insight was lacking.

Physical examination disclosed a blood pressure of 160 systolic and 108 diastolic and a depressed respiratory rate, varying from 7 to 10 respirations per minute. The head and neck were essentially normal. The lung fields were clear. The heart was normal, as were the abdomen, genitalia and rectum. There were no unusual neurologic findings. The lethargy, impaired coordination and depressed respirations were believed to be due to central respiratory inhibition. Laboratory tests were essentially noncontributory. The Wassermann reaction was negative. The blood bromide value was normal. The spinal fluid pressure in the sitting position was 340 mm. of water initially and 270 mm. after withdrawal of 10 cc. The fluid was clear, with a negative Wassermann reaction, a sugar content of 64 mg. per hundred cubic centimeters, chlorides 740 mg., protein 29 mg., a negative reaction to the Pandy test, 3 white blood cells per cubic millimeter and a colloidal gold curve of 0110000000. An electroencephalogram made on September 16 was interpreted as normal.

One Rorschach test was administered on September 16, sixteen days after the patient's admission, shortly after symptomatic improvement had begun. Since this test could not be completed, only a qualitative evaluation was possible. An analysis of the record revealed sequence disturbances and an abundance of pure color and symbolic responses. Edging (holding the card up to the eyes in a position parallel to the field of vision) was also apparent. The record was grossly abnormal, but, since the inquiry could not be completed, a precise diagnosis was not possible.

The patient was retested on September 27, when he was apparently free from clinical symptoms. In the second test he made a definite attempt to control emotional impulsivity and the symbolic responses disappeared as did the edging. While he was still erratic in his approach, he seemed better able to check his percepts with reality and to organize his response. In neither record did there appear to be any contaminated responses, although his first protocol suggested a tendency to confabulation. While the second Rorschach test indicated improvement, the findings remained grossly abnormal in spite

From the Psychiatric Institute of Grasslands Hospital.

1. Brown, E. A.: A Clinical Evaluation of a New Antihistamine Agent "Trimeton": Conjoint Study of Two Hundred and Twenty-Seven Patients, Ann. Allergy **6**: 393 (July-Aug.) 1948. Schiller, I. W., and Lowell, F. C.: Trimeton: A New Antihistaminic Drug, New England J. Med. **240**: 215 (Feb. 10) 1949.

of the clinical recovery. However, although this test revealed the presence of gross disturbance in intellectual and emotional functioning, it did not show Rorschach features commonly considered specific for schizophrenia.

For the first seven days of his stay in the hospital the patient was lethargic, slept a great deal, did not mix with other patients and was preoccupied and withdrawn. He appeared somewhat unsteady on his feet; he walked about the ward slowly but preferred to rest on the lounge or his bed in awkward positions. The third day in the hospital he was found sleeping under his bed. The same day he was found sprawled across the table and chair in the dining alcove. His affect was labile and inappropriate. He spoke irrationally to ward personnel. Occasionally he would shake his head and blink his eyes as if trying to clear his head. On the eighth day his symptoms began to disappear. During the next few days he became more lively and alert, friendly, cheerful and sociable and began to help about the ward. He ate and slept well, looked neater, played Ping-pong and cards, went to ward movies and engaged in occupational therapy. He remained well throughout the final four weeks of his hospitalization and was discharged on Oct. 6, 1949.

EXPERIMENTAL FINDINGS

The following experiment was performed: a control electroencephalogram was made on Aug. 29, 1949. On October 13 another electroencephalogram was made, after the patient (then an outpatient) had ingested eight 25 mg. tablets of prophenpyridamine for two and a half days. A third electroencephalogram was taken on October 19, after the patient had ingested eight 4 mg. tablets of chlorprophenpyridamine maleate (chlortrimeton®) for two and a half days. On the second and third days following the initiation of prophenpyridamine medication the patient felt "drowsy and weak in the knees." No side effects were noted with chlorprophenpyridamine maleate.

The first record, interpreted as normal, was a low voltage fast type with some low voltage base line sway. During a period of eight seconds when the patient was drowsy, some low normal voltage 5 to 7 per second waves appeared. Hyperventilation caused the appearance of 4 to 7 per second waves in the last ninety seconds. The second record after prophenpyridamine medication was the same as that for the control except that hyperventilation produced normal voltage 5 to 7 per second waves about one minute earlier. The third record following chlorprophenpyridamine maleate medication was clearly abnormal. There were significant quantities of low normal voltage 5 to 7 per second waves in all regions, with several 5 to 20 second runs of 7 per second activity. The record, in general, contained much low voltage fast activity. Hyperventilation produced a significant increase in normal voltage 5 to 7 per second waves after thirty to forty-five seconds. In the third minute there was a moderately large build up of high voltage 3 per second waves. Return to resting patterns was moderately prolonged, requiring more than two minutes.

CONCLUSIONS

The onset of the psychosis, following prolonged medication with prophenpyridamine (trimeton®), the absence of other known precipitating factors, the nature of the illness itself and the prompt recovery on withdrawal of medication leave no doubt that this is a case of true toxic psychosis due to this drug. In view of the previously known central toxic effects of this and similar drugs, it is not surprising that a toxic psychosis developed in a patient as a result of his taking antihistaminics. It can be predicted safely that with the increasing indiscriminate use of antihistaminics, similar cases will appear and be recognized.

The experimental results reported in this paper are inconclusive. However, the fact that therapeutic doses of chlorprophenpyridamine maleate produced significant electroencephalographic changes within three days is considered worthy of reporting as a lead for further investigation.

CURETTEMENT TECHNIC FOR BIOPSY

Use in the Detection of Cutaneous Cancer

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As a rapid and easy method of obtaining tissue when basal or squamous cell carcinoma of the skin is suspected, we have been impressed with the efficacy of the simple curettement. For over three years we have employed a curetting technic for biopsies of cutaneous lesions suspected of being basal or squamous cell carcinoma. Although any small, sharp curet can be used, we have found the straight, sharp Buck type of ear curet, size 2, to be the most suitable. The curetting ring of this instrument has a diameter of 3.5 mm., which allows one to obtain sufficient tissue yet is small enough to scoop into even the tiniest lesion. Smaller curets are less satisfactory because the amount of tissue obtained is frequently insufficient. Larger curets can be used when the tissue is bulky and proliferative but do not lend themselves so well to penetration of the smaller lesions.

The curettement is performed by simply applying the cutting edge to the lesion and, with a scooping motion, quickly digging out a small clump of tissue, which usually remains within the ring of the curet. One removes this by immersing and shaking the curet in the fixative solution. The specimen thus obtained can be sent to the laboratory. Usually no anesthetic is required. The pain experienced, if any, is no worse than that experienced in the injection of an anesthetic.

This technic can be applied to practically all erosions or ulcers and to most nodular lesions. The more friable the tissue, the more easily it lends itself to curettement. The method cannot be used on intact skin or in cases in which the skin overlying a lesion is intact and of normal thickness. The cutting edge of the curet is not sharp enough, nor is the curet as a whole strong enough, for such a purpose.

The material from the curet, which has been shaken into 10 per cent formaldehyde solution, usually consists of several small fragments of tissue, with the maximum size of the individual pieces usually under 2 mm. in diameter. These pieces are placed in the center of a piece of gauze 4 by 4.5 cm. The open ends of the gauze are placed together and twisted to form a small bag. A fine thread may be twisted around the end as an extra precaution to avoid spilling the contents.

The biopsy specimen is processed by any standard paraffin technic, and the tissues stand out on the gauze, after being removed from the paraffin bath, as white, solid fragments which can readily be picked off with small, heated forceps and embedded in paraffin block for sectioning. The sections are cut at 7 microns and stained with hematoxylin and eosin. While the amount of tumor tissue on the prepared slides is small, the structure and arrangement of the cells in the tiny plugs can be easily seen microscopically.

We have thus far made well over a thousand biopsies with this method in cases in which carcinoma of the skin has been suspected. In 90 per cent of these instances, the amount of tissue secured was sufficient for histologic diagnoses. In the 10 per cent in which insufficient tissue was secured, the biopsy was repeated, with some other method. The curetting in no way interferes with any subsequent method of biopsy. In contrast to some other technics, this procedure does not cause cosmetically objectionable mutilations, nor does it interfere with subsequent therapy by distorting the anatomic relationships of the involved site.

Although this technic can be used in the more proliferative lip lesions, we do not routinely employ it for the diagnosis of early

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lip cancer, which usually is not particularly friable. The material obtained by curettement of this latter type of lesion is likely to consist merely of fine shreds which are not suitable for diagnosis. We do not recommend this method of biopsy when malignant melanoma is suspected.

SALMONELLA ORANIENBURG IN A PERIRECTAL ABSCESS

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Salmonellae are but rarely found in abscesses or other localized purulent infections. In the files of the Salmonella Center at Beth Israel Hospital, New York, which covers over 5,000 cases of human salmonella infections and carriers, there are only 44 cases in which abscess formation or localized infections of the integument dominated the clinical picture.[1] Similarly, Edwards, Bruner and Moran, in their statistics on 2,949 isolations of salmonellae from man, listed but 18 abscesses.[2]

From the purely clinical point of view, salmonellae in localized infections present no problems as distinguished from those of similar infections of different causation. They could be considered bacteriologic oddities were it not for the infective nature of these organisms. In contrast to the common agents of purulent infection, salmonellae are infective by the oral route. Thus pus and drainage from a salmonella abscess present a definite risk to members of the medical and nursing staffs and to other persons in contact with the patient. Particularly, there exists the possibility of introducing a most undesirable enteric infection into a surgical ward; a risk comparable to that incurred by an unrecognized case of diarrhea due to salmonella or shigella organisms or a carrier of these organisms. Recent experience [3] has shown the tenaciousness with which salmonella infections may cling to a ward. (For the mechanisms of salmonella infection, see data and references in articles by previously cited authors,[4] also Weil [5] and Bornstein.[6])

The necessary precautionary measures against such accidents obviously can be taken only if prompt etiologic diagnosis is made by appropriate bacteriologic methods. The following case emphasizes the need of paying attention to the causative agents of relatively trivial infections from the point of view of their infective potentialities.

REPORT OF CASE

History.—J. D., a white man aged 34, was admitted to the Bronx Hospital Oct. 17, 1949 with rectal pain and the sensation of a mass near the anus for five days. He had been completely well until two weeks prior to admission, when mild abdominal cramps and some nonbloody diarrhea developed after he had a meal consisting of vegetables and bread at a popular cafeteria in midtown New York. He remained on a diet of vegetables and bread, having lunch at this same cafeteria on the following two days. On the third day the diarrhea disappeared spontaneously. Five days prior to admission, the patient consulted his physician because of rectal pain and the sensation of a mass. He was treated with injections of penicillin and sitz baths but obtained no relief. His past history was noncontributory.

Physical Examination.—On admission the patient, a well developed man, was not visibly ill. The temperature was 100 F. rectally, the pulse rate 72 and the respiratory rate 20 per minute. The blood pressure was 130 systolic and 90 diastolic. Aside from a well healed scar from a McBurney incision, the only positive observation was a fluctuant perirectal mass about 1 cm. in diameter. There was no redness nor signs of inflammation about this mass. It was extremely painful to palpation, but rectal examination beyond the bulge into the rectal canal revealed normal conditions and was not painful. The red blood cell count was 4,500,000; the hemoglobin was 92 per cent (13.3 Gm.), and the white cell blood count was 6,000 with a normal differential count. The urine was normal.

Operation.—On the morning following the patient's admission, operative intervention was performed. The abscess was located just beyond the mucocutaneous line, on the skin side, at about 11 o'clock. After adequate preparation of the skin, the abscess was aspirated and about 4 cc. of purulent fluid obtained. The abscess was then opened by a radial incision. An attempt was made to find an internal opening through the rectal mucosa, but a definite opening was not found. Nevertheless, the mucosa of the rectum was incised in the line of the original incision to a point just beyond the limits of the abscess cavity. The base of the cavity was curetted, and the wound was packed with iodoform-treated gauze. Culture from the pus yielded Escherichia coli, a nonhemolytic Streptococcus fecalis and Salmonella oranienburg.

Postoperative Course.—The patient had a normal postoperative course. Two weeks after the operation the wound was entirely healed. His bowels moved regularly, once a day. As soon as the laboratory report had been received, the patient was isolated. The appropriateness of this measure was illustrated by the finding of S. oranienburg in the first postoperative stool. However, culture from the feces of the following day did not reveal the organism, nor did subsequent cultures during the next two weeks.

COMMENT

It is likely that the intestinal upset reported by the patient nine days prior to the appearance of the abscess marks the time of first contact of the patient with salmonella. It cannot be stated whether the perirectal tissue was infected via the blood stream or by contiguity, although the presence of two other enteric organisms may suggest the latter route. The stool examination showed that the patient did harbor salmonellae in his intestinal tract immediately after surgical intervention, although there were no symptoms of enteritis.[7] Subsequent examinations of the feces gave no indication that the patient had become a carrier.

As to the salmonella type found in this case, it is perhaps of some interest to note that among 44 cases on file in the Salmonella Center at Beth Israel Hospital, 23 are members of group C_1, 13 of which are Cholerae suis and 4, S. oranienburg.[1b] Percentagewise, this is much more than the share of group C_1 organisms and of these types in isolations from other sources.

SUMMARY

1. A case of perirectal abscess is reported in which Salmonella oranienburg was identified in the pus, together with Escherichia coli and Streptococcus fecalis.

2. Though salmonellae are seldom found in abscesses (less than 1 per cent of all salmonella isolations), they are of practical interest because they are a source of infection for the surrounding contacts which is the more easily overlooked because the infection itself presents no distinguishing features.

900 Grand Concourse.

From the Departments of Surgery and Bacteriology, Bronx Hospital, New York.

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4. Footnotes 1a, 2 and 3.

5. Weil, A. J.: Medical and Epidemiological Aspects of Enteric Infections, Ann. Rev. Microbiol. **1**: 309, 1947.

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7. It is possible that incision of the mucosal surface of the abscess may have contaminated the lower part of the intestine.

SINGLE USE, FILLED HYPODERMIC SYRINGE FOR INDUCING SKIN ANESTHESIA FOR VENESECTION IN BLOOD BANK WORK

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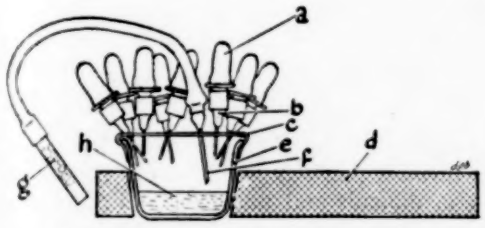
HENRY NAFTULIN, B.S.
and
MARTIN FREUNDLICH, M.D.
Chicago

There is at present no fully dependable method of eliminating the hazard of transmitting hepatitis in whole blood transfusion work, and every possible precaution should be taken to minimize the risk. Thus, modern blood banks use individual syringes and hypodermic needles to anesthetize the donor's skin preliminary to venesection, lest a chance hepatitis virus from one donor be transferred to another. Considerable labor and expense is encountered, at least by the larger blood banks, in the preparation of large numbers of syringes.

The small filled hypodermic syringe (and assembly) in the accompanying illustration has been in use at the Samuel Deutsch Serum Center for some time. It has been found easy to use, effective and safe. The hypodermic syringe itself consists of a small orifice rubber bulb (*a*) which fits snugly over the hub of an ordinary hypodermic needle (*b*); in use the filled syringe is withdrawn from the rubber dam (*c*), the needle is inserted into the donor's sterilized skin and the anesthetic in the bulb driven into the skin by compressing the bulb between the fingers. After one-time use, the point of the hypodermic



Multiple filled hypodermic syringe assembly.

syringe is thrust into the thick sponge rubber pad (*d*), where it is automatically designated by position as having been used, and the delicate tip of the needle is simultaneously protected.

The size of the assembly depends on local needs. We use from twenty-five to thirty hypodermic syringes mounted in a rubber dam (*c*). The longer needle (*f*) provides for air exchange through a short length of rubber tubing and glass-wool air filter (*g*). The rubber pad (*d*) is clean but not autoclaved. All other parts are assembled as indicated in the diagram. The assembly is then turned upside down, care being taken that the point of the needle (*f*) extends beyond the anesthetic (*h*) in the inverted position. During autoclaving the air in bulbs (*a*) is largely expelled; it is replaced during cooling by the anesthetic. Once the assembly has cooled, it is reinverted to the upright position shown. The cooled sterile assembly may then be fitted, if desired, into a hole cut into the sponge rubber pad (*d*) and is ready for use. Repeated sterility tests of unused filled hypodermic syringes and of the surplus anesthetic several days after complete use of an assembly have shown no contamination. We use the rubber dam (*c*) only once.

The anesthetic employed is not the customary procaine, which presents problems in autoclaving, particularly if it is in contact with metal during heating. We employ chemically pure benzyl alcohol 2 per cent and sodium chloride 0.9 per cent in distilled water. This chemical should, of course, be as pure as possible. In our experience it has been satisfactory as an anesthetic, dependable and safe. It is emphasized that our experience is restricted to the small amounts required for induction of anesthesia in the skin of blood donors.

From the Samuel Deutsch Serum Center, Michael Reese Research Foundation.

RUPTURE OF THE RECTUS ABDOMINIS MUSCLE FOLLOWING ELECTROSHOCK THERAPY

NATHAN SAVITSKY, M.D.
and
WILLIAM KARLINER, M.D.
New York

The literature available to us has failed to disclose a case of hematoma of the rectus abdominis muscle appearing shortly after electroshock therapy.

REPORT OF CASE

A white woman aged 51 had had a schizophrenic-like syndrome for more than ten years and had been institutionalized several times during this period. A number of courses of electroshock therapy were given, with improvement following each series. The remissions varied from a few months to two years.

Past history included arterial hypertension (blood pressure up to 230 systolic and 124 diastolic), a right nephrectomy in 1939 for nephrolithiasis with infection, a severe attack of polyarthritis in 1923 and influenza in 1918. No family history of nervous or mental disease was obtained.

On Feb. 20, 1948, five hours after an ambulatory electroshock treatment with a typical grand mal response of about one minute's duration, the patient complained of severe abdominal pain in the right lower quadrant. The abdominal tenderness and rigidity, as well as a leukocyte count of 16,000 with a shift to the left, suggested a diagnosis of acute appendicitis. At operation the right rectus muscle was found torn near its inferior end and there was about a pint of blood in the preperitoneal area. After careful control of bleeding points the wound was closed, and the patient made a rapid and uneventful recovery. Three weeks after the operation the patient's paranoid trends again became pronounced. Curare was then given prior to each electroshock treatment. Since then the patient has been treated intermittently during exacerbations of psychotic behavior without ill effects.

COMMENT

Although the electroshock treatment and the hematoma of the abdominal wall may be coincidental, the probable role of the severe contraction of the abdominal muscles during the electrically induced seizure cannot be ignored. The absence of more frequent incidents of this type, considering the widespread use of this therapeutic regimen, indicates the probable existence of other factors which predispose to this complication. Influenza was mentioned by Teske [1] as playing a probable accessory etiologic role, perhaps by a direct effect on the muscle. Tears of other muscles during the course of electroshock therapy are apparently rare. Careful search of the already extensive electroshock literature revealed mention of such tears by Kalinowsky (supraspinatus tendon [2]), Pacella (deltoid muscle [3] and trapezius muscle [4]) and by Geller (back muscles [5]). Anatomic verification of these lesions is not reported by any of the aforementioned investigators.

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Upholding the Honor of the Profession.—A physician is expected to uphold the dignity and honor of his vocation.—Section I, Chapter III of the PRINCIPLES OF MEDICAL ETHICS of the American Medical Association.

Council on Foods and Nutrition

This paper was prepared at the request of the Council and is one of a series appearing in THE JOURNAL. *In the near future the entire series will appear in book form as the Council's Handbook of Nutrition.* JAMES R. WILSON, M.D., *Secretary.*

FLUID THERAPY

Relation to Tissue Composition and the Expenditure of Water and Electrolyte

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and
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(*Concluded from page 373*)

Under normal conditions, without sweating, about two thirds of the insensible water loss occurs by diffusion through the skin. The rate of water loss from the respiratory tract depends on the volume of respiratory exchange and the content of water of the inhaled and exhaled air. These are in turn dependent on the temperature and humidity of the environmental air, since the exhaled air is about 88 per cent saturated with water at 33 C. When there is hyperpnea, the magnitude of the water losses through the lungs is difficult to measure but probably reaches values five times as great as the normal rate.[55] In estimating the importance of the losses from the lungs, it should be remembered that an increase in the loss of water from the lungs may be partially compensated by a decrease in the activity of the sweat glands. Water loss from the lungs is not accompanied by loss of electrolyte.

The insensible loss of water from the skin is dependent chiefly on a gradient for diffusion through the skin. This is dependent chiefly on skin temperature if the surface is dry. A small amount of electrolyte is lost from the skin when there is no sweat, presumably through desquamation, though there may be minimal activity of sweat glands as well. Losses of water in sweat are discussed in the excellent book by Adolph and associates.[56] In the thermal balance of the body, the skin acts like a black body with a temperature of about 33.3 C. (92 F.). The body gains heat from the environment and objects above this temperature and loses heat to objects and environment below this temperature. At an environmental temperature of about 26.7 C. (80 F.), body temperature is maintained without sweating and without more heat production than that characteristic of rest. At a given temperature, the radiant energy of direct sunshine may add as much as 50 per cent to the heat balance when only indirect energy from the sky is acting on the body. The volume of sweat is normally produced in amounts sufficient to maintain the body temperature when the metabolic production of the heat and the positive heat balance from the environment are greater than the losses produced by evaporation of the insensible water and by the heat losses through radiation, conduction and convection. The efficiency of the evaporation of sweat is not seriously impaired until humidity is greater than 80 per cent. Air currents accelerate the rate of evaporation and the exchange of heat with the environment.

The volume of sweat may reach 2.5 liters an hour in men at hard work at a high environmental temperature. A few measurements on normal infants kept practically nude showed that raising the environmental temperature from 26.6 to 33.3 C. (80 to 90 F.) increased the loss of water from the lungs and skin from 48 to 108 ml. per kilogram per day. Presumably, at least as much as 60 ml. of sweat per kilogram per day was produced at the higher temperature. Adults sitting in the shade at similar temperatures showed comparable sweating per unit of heat production.[56] The calculated losses of sweat in infants with diarrhea, studied in hot weather in August in Galveston, Texas, and Dallas, Texas, averaged 70 ml. per kilogram per day.[55]

When the environmental temperature is higher than 33.3 C. (92 F.) all the loss of heat is accounted for by evaporation of water, and light clothing diminishes the amount of sweat by prevention of the loss of drops of sweat from the body surface and decrease of the addition of heat from the environment. At lower temperatures, clothing sometimes increases the volume of sweat by decreasing the loss of heat by radiation and convection. Mere observation of the skin is inadequate to detect the onset of sweating or to estimate its amount. For a lightly clothed person at a room temperature of 85 to 90 F. an allowance for the loss of 50 ml. of sweat for each 100 calories metabolized is apparently indicated. Since operating rooms are likely to be quite warm, water loss in sweat may be considerable during operative procedures. Air conditioning and avoidance of overheating are, therefore, important therapeutic measures, particularly for patients with disturbance in the metabolism of water and electrolyte.

The quantity of electrolyte in sweat has been found to be so variable that any prediction of the composition of sweat is difficult and unreliable. For clinical purposes, the concentration of sodium and chloride may be assumed to be 25 to 50 millimoles per liter and that of potassium, 15 millimoles. These values may be somewhat high for normal, acclimated persons. Actually, analyses of sweat indicate that the concentration of sodium and chloride may vary from 5 to 100 millimoles per liter. There is evidence that acclimatization to hot weather is accompanied by a tendency to excrete a less concentrated sweat.[57] Recent work indicates that the concentrations of sodium, potassium and chloride in sweat are influenced by the adrenocortical hormones. Conn has shown that patients with adrenal insufficiency have high concentrations of sodium and chloride and low concentrations of potassium in the sweat induced by heat. In contrast, patients with adrenocortical tumors or patients receiving pituitary adrenocorticotrophic hormones or desoxycorticosterone acetate have concentrations of sodium and chloride that are lower than normal and concentrations of potassium that are higher than normal.[58]

Abnormal urinary losses of water and electrolyte occur when there are abnormal loads or disturbances in renal function. Abnormally large renal loads are produced by ketosis and glycosuria. Diets high in protein or electrolyte increase the urine volume. Fifty grams of dextrose or 9 Gm. of sodium chloride require about 250 ml. of water for excretion in urine which is maximally concentrated. When renal disease produces a urine of fixed specific gravity, the water for urine formation is limited to the volumes which will contain the substances to be excreted at the fixed specific gravity (usually at a specific gravity of 1.010 to 1.012). As is shown in figure 4 (part 1, page 373), the solids

Because of lack of space, this article has been abbreviated in THE JOURNAL by omission of the footnotes. This complete article will appear in the reprints, which may be requested from the authors.

produced in the metabolization of 100 calories will require about 85 ml. of water if the specific gravity of the urine is 1.012. A total water intake of about 150 ml. per 100 calories metabolized is required for urine of this specific gravity. This amounts to about 4 liters in an active adult.

Electrolyte disturbances are likely to develop in patients with chronic nephritis because the kidneys not only are unable to conserve water but also waste sodium chloride[45] and, in some cases, potassium.[25] Severe diminution of the rate of glomerular filtration is also accompanied by inability to excrete adequately sulfate, phosphates and other acids. Administration of sodium chloride may overcome the losses of sodium chloride but probably aggravates the tendency to excrete potassium. Furthermore, renal insufficiency often is accompanied by inability to form an acid urine and to excrete ammonium in order to save sodium and potassium.[43] The retention of phosphate and other acids and the wastage of sodium and perhaps potassium produces metabolic acidosis. The diagnosis of potassium deficiency has been established in a few patients with nephritis, in whom paralysis accompanied by low concentration of potassium in serum developed. The paralysis and weakness were relieved by administration of potassium salts.[25] On the other hand, oliguria and anuria may lead to retention of potassium and a rise in the serum concentrations to levels producing heart block.[58]

During convalescence from anuria and in some types of nephritis[60] large volumes of urine may be formed which contain little sodium and chloride. In these patients, the usual intake of salt may be sufficient to lead to high serum concentrations of these ions. A similar reaction occurs in certain infants as a result of a congenital anomaly in tubular function causing obligatory polyuria.[61] The polyuria of diabetes insipidus, on the other hand, is not often accompanied by electrolyte disturbances because the tubules function normally in preserving electrolyte concentrations of the serum. The tubules reabsorb sodium chloride when the intake of water is high and the intake of salt is low and fail to reabsorb sodium chloride if the intake of salt is high. Patients with diabetes insipidus merely have difficulty in drinking enough water to replace the excessive losses in the urine.[62]

Adrenal insufficiency leads to deficits of sodium and chloride because of the inability of the kidneys to conserve these ions.[63] Accompanying this loss, there is a tendency toward retention of potassium, especially when circulatory failure develops.[64] Renal function may be restored, though inadequately, by administration of sodium chloride.[63] Desoxycorticosterone acetate not only enables the kidneys to reabsorb sodium and chloride from the glomerular filtrate but also increases the rate of excretion of potassium.[65] This may lead to deficit of potassium, particularly if large amounts of sodium chloride are given.[66] The deficits of potassium may lead to low concentration of chloride and potassium in the serum and to high concentration of serum bicarbonate and serum sodium when renal adjustment to deficit of potassium is attained in the presence of abundant sodium chloride (fig. 2). Certain adrenocortical tumors have a similar effect.[15] The deficiency of potassium, especially when large amounts of sodium chloride are given, probably explains some of the instances of cardiac failure noted in patients receiving desoxycorticosterone acetate. Paralysis due to deficiency of potassium has been noted in animals receiving desoxycorticosterone acetate.[66a]

During peripheral circulatory failure (shock), there are disturbances in renal function. The rate of glomerular filtration decreases, and the concentration of nonprotein nitrogen rises.[67] Alteration in renal circulation during shock seriously interferes with renal regulation of electrolyte concentrations.[7b] Furthermore, accompanying local changes in the tissues, potassium leaves the cells and is replaced by somewhat less than equivalent amounts of sodium. This produces metabolic acidosis and leads to high concentration of potassium in the serum.[28] As long as urine is excreted, a high serum potassium leads to urinary excretion of this ion. Loss of potassium in the urine in diarrhea and diabetic acidosis is, in part, explained by this type of reaction.[38] Further study will probably show that disturbances in renal function explain other changes in body water and electrolyte that develop in shock.

Abnormal losses of water and electrolyte from the gastrointestinal tract occur as a result of vomiting, diarrhea, escape of gastrointestinal fluids through fistulas and aspiration from catheters introduced into the stomach and upper intestines. The approximate losses

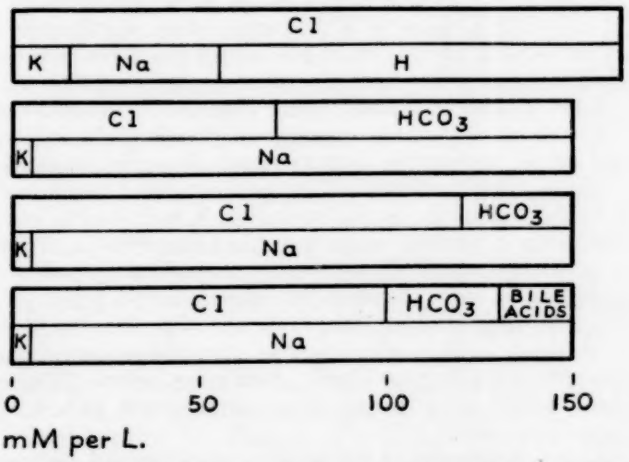

Fig. 5.—Diagrammatic representation of the concentrations of gastrointestinal secretions. From the top down, gastric, pancreatic, small intestinal and hepatic bile.

may be estimated from the volumes and composition of the fluids lost. Figure 5 shows the average concentrations of certain gastrointestinal fluids. The volumes may be measured but usually can only be estimated approximately. The losses determine the tissue deficits.

As the chart shows, the gastric juice contains relatively more chloride than sodium and appreciable amounts of potassium. As excreted by the chief cells, the chloride concentration is somewhat higher than the concentration of sodium in serum.[68] The gastric contents are the result of the mixture of the acid excretion of the chief cells with neutral or slightly alkaline secretions of other cells. The amounts of each kind of secretion are so variable that gastric contents may contain considerably more chloride than sodium or more sodium than chloride. Loss of acid gastric juice leaves the body with a relative excess of sodium available to form bicarbonate in extracellular fluids. This type of alkalosis is typical of pyloric obstruction.[69] In the vomiting of renal failure and as a result of certain infections, the fluid is not acid and may produce no change in acid-base equilibrium or even acidosis. In certain cases of vomiting in children typified by periodic vomiting, acidosis results not only because the fluid lost is not highly acid but because starvation leads to nondiabetic

ketosis.[70] High intestinal obstruction and the loss of fluids through catheters introduced into the upper intestinal tract after operative procedures produce alkalosis because the amount of gastric fluid removed is greater than the amount of the intestinal juices.[70a]

The stools in diarrhea vary widely in composition. In some patients the electrolyte concentrations are so small that little decrease in body electrolyte develops, despite the loss of large volumes of water in the stools. In other patients the stools contain so much water and electrolyte that the tissues are rapidly depleted of both water and electrolyte. The concentrations per kilogram of stools vary from 12 to 90 millimoles for sodium, from 10 to 110 millimoles for chloride and from 10 to 80 millimoles for potassium.[38] The daily losses in severe infantile diarrhea are about 250 Gm. of water, 16 millimoles of sodium, 11 millimoles of chloride and 8 millimoles of potassium per day. In adults, cholera, severe diarrhea and dysentery probably lead to proportional losses. Sprue and celiac disease do not produce as severe losses of electrolyte except during periods of exacerbation. Practically all types of diarrhea tend to produce greater relative losses of sodium and potassium than of chloride. The result is a type of metabolic acidosis in which changes in the composition of intracellular fluids play an important role which has already been discussed.

Gamble and associates[71] and Darrow[72] described a rare type of congenital anomaly of intestinal absorption leading to obligatory watery stools containing more chloride than sodium. The patients had continual metabolic alkalosis and deficits of both chloride and potassium. Recent experiments indicate that diarrhea in which the stools contain more chloride than sodium develops in rats subjected to potassium deficiency.[73] Albright and Gardner have seen a similar development in an adult, which suggests that a change in intestinal absorption leading to stools containing more chloride than sodium may result when pronounced deficit of potassium develops.[74]

In the discussion of the balance of water and electrolyte, it is necessary to point out that balances of water and electrolyte within the body affect the amount of water and electrolyte available for expenditure. If there is an increase in extracellular fluids owing to formation of edema or exudates, sufficient sodium and chloride must be retained to preserve the composition of extracellular fluids. When such fluids are excreted, a corresponding amount of sodium and chloride is released in order to preserve extracellular concentration. These facts must be borne in mind in estimating the requirement of water and electrolyte. There is such a small amount of water and electrolyte in the body that can safely be used for obligatory expenditure that small losses lead to symptoms of dehydration. The dangers of dehydration have been sufficiently emphasized so that physicians do not knowingly call on body reserves to meet obligatory expenditure. It is not so generally realized that expansion of body fluids may leave the rest of the body with insufficient water and electrolyte to cover obligatory expenditure and to provide adequate quantities of water and electrolyte for the renal and circulatory systems. Burns, exposure to cold, extensive trauma, inflammatory reactions and tourniquet injury[75] produce extensive expansions of fluids at the site of injury. The fluid accumulated resembles extracellular fluids, and the localization of water and electrolyte has the same effect as loss of extracellular water and electrolyte.[32]

Accompanying the circulatory changes of tissue injury, potassium may be lost from the cells and replaced by sodium.[28] The decrease in extracellular sodium produces acidosis, which is further aggravated by changes in renal function dependent on the lack of water and electrolyte available for renal and circulatory functions. Part of the benefit of sodium chloride therapy in shock is dependent on the changes in the cells and the obligatory expansion of extracellular fluids that is taking place.

IV. CLINICAL AND ELECTROCARDIOGRAPHIC DISTURBANCES ACCOMPANYING HYPOKALIEMIA

Certain symptoms and signs and electrocardiographic changes are known to be accompanied by low concentrations of potassium in serum and to be abolished by the restoration of the normal concentration. The following signs and symptoms have been observed: (1) weakness and hypotonia of the skeletal muscles progressing to frank paralysis (usually the paralysis of the arms and legs appears first and that of the respiratory muscles later); (2) dyspnea with gasping respirations in which the accessory muscles of respiration are invoked; (3) cyanosis which is chiefly respiratory in origin but may be in part cardiac; (4) abdominal distention which seems to be dependent on atonia of the smooth muscles (in experimental animals extreme deficiency of potassium produces paralytic ileus); (5) nausea and vomiting; (6) cardiac enlargement with the appearance of systolic murmurs; (7) increased pulse pressure with Corrigan pulse, and (8) elevated venous pressure and signs of cardiac failure. The paralysis of the diaphragm and abdominal muscles and the functional disturbances of the myocardium account for the major clinical signs and symptoms.[76]

The electrocardiographic changes have received considerable study.[76a, b] While the changes are not absolutely specific, their reversal accompanying restoration of the concentration of potassium in serum indicates that they are related to serum potassium concentration. The changes which have been attributed to abnormal serum potassium are illustrated diagrammatically in figure 6. The following changes accompanying low contrations of potassium in serum should be noticed: (1) slightly prolonged Q-T interval, (2) decreased height and inversion of the T waves, (3) rounded and prolonged T waves, (4) depression of the S-T segment and (5) possible inversion of the P waves, extrasystoles and auriculoventricular block. The precordial lead CR_3 has been found the most useful in measuring the Q-T interval. The height of the T waves has been found to be influenced by the p_H, by the partial pressure of carbon dioxide and by the concentration of potassium in serum. The electrocardiographic changes correlate only approximately with the decrease in concentration of potassium in serum.

Physiologically significant decrease in the concentration of potassium in serum may occur without characteristic signs or symptoms. Since it is not known how often or under what circumstances low concentrations of potassium in serum lead to anatomic lesions of the heart nor when serious symptoms may develop, decrease in the concentration of potassium in serum should be suspected in those conditions known frequently to be accompanied by deficiency of potassium or decrease in serum potassium concentration or both. Flame photometry has made the measurement of serum potassium a practical clinical examination. The finding of a low concentration of potassium in the serum confirms the

diagnosis of low serum potassium, but low serum potassium does not develop in all forms of deficiency of potassium in the body as a whole. Consideration of the contribution of hypokaliemia and potassium deficiency to the symptoms is especially important, since patients likely to have disturbances in body potassium usually have other disorders which may mistakenly be considered adequately to explain the signs and symptoms. The treatment of this condition consists in the oral or parenteral administration of potassium salts.

V. CLINICAL AND ELECTROCARDIOGRAPHIC DISTURBANCES ACCOMPANYING HYPERKALIEMIA

Certain signs and symptoms and electrocardiographic changes develop when the serum potassium concentration is elevated and are reversed if the serum potassium returns to normal. The following signs and symptoms have been observed in hyperkaliemia: (1) listlessness and mental confusion; (2) numbness and tingling of the extremities with a sense of weakness and heaviness of the legs; (3) cold, gray pallor; (4) bradycardia and occasionally totally irregular rhythm; (5) peripheral vascular collapse with diminished quality of the heart sounds and low blood pressure; (6) in a few patients with uremia, a rapidly ascending flaccid paralysis without involvement of the trunk, head or bladder, and (7) cardiac arrest.

The electrocardiographic abnormalities correspond roughly to the degree of elevation of serum potassium concentration. The changes are illustrated diagrammatically in figure 6. At concentrations of 6.5 to 7.8 millimoles of potassium per liter, alterations in the T wave begin to appear. These alterations are almost always present when the potassium level is above 8 millimoles per liter. Heart block appears above about 10 millimoles per liter. The sequence of changes with increasing concentrations of serum potassium is: (1) appearance of peaked T waves; (2) increased duration of QRS complex; (3) increased duration of the P-R interval leading to auricular standstill; (4) biphasic curve with progressive delay in ventricular conduction, and (5) total arrhythmia progressing to cardiac arrest.[77]

Hyperkaliemia arises almost exclusively when renal excretion is greatly diminished because of renal disease or oliguria accompanying shock and dehydration. The increase in extracellular potassium may come from food or potassium-containing salts administered either orally or parenterally. The increase may also arise from the release of potassium from the cells caused by the catabolism of cellular structures or the release of cellular potassium which accompanies anoxia or other disturbances in cellular metabolism. It is difficult, if not impossible, to produce potassium intoxication by the oral administration of potassium salts to patients with normal kidneys and circulation. However, too rapid parenteral administration of potassium salts may produce hyperkaliemia, though the occurrence of serious symptoms has never been noted in our rather extensive experience or in that of others using similar methods of parenteral administration of potassium.

In almost all the reported cases of hyperkaliemia, the concentrations of sodium in serum have been low. Some of the symptoms and electrocardiographic changes may be related to the abnormal ratio of potassium to sodium. The low concentration of serum sodium certainly contributes to the circulatory and renal failure in many instances.

The treatment consists of stopping the intake of potassium, retarding the rate of release of potassium from the cells, promoting the return of extracellular potassium to the cells and increasing the excretion of potassium by the kidneys. Intravenously administered dextrose will retard the catabolism of protein, which leads to release of potassium from the cells in the fasting patient. It also promotes the taking up of potassium from the extracellular fluids by the formation of glycogen and perhaps by restoring certain cellular functions. Hypertonic sodium chloride solution is indicated, particularly when the serum is hypotonic, since it will improve the circulation and the renal function. The intravenous injection of calcium salts seems to be indicated on physiologic grounds but has been found to be of only transient benefit.

VI. THERAPEUTIC APPLICATIONS

Fluid therapy should be based as far as possible on an estimation of the changes in tissue composition and the rate of expenditure of water and electrolyte. In addition to evidence of dehydration or edema obtained from the physical examination, the direction of the change in body water may be obtained from the body weight. Evaluation of the acid-base equilibrium requires the determination of serum bicarbonate and p_H, which should always be evaluated in relation to the respiratory rate and depth in order to estimate the efficiency of the exchange of gases in the lungs. The serum concentrations of bicarbonate plus chloride, or, more reliably, the concentration of sodium, shows whether fluids are hypotonic or hypertonic. The concentration of potassium is valuable but alone does not determine the existence of potassium deficiency. When the therapy is followed from day to day, the body weight is the most reliable evidence of change in body water and should be determined accurately in adults as well as infants. Measurement of the volume of urine and other excreta is often necessary in making the decision as to the kinds and amounts of fluid to be administered. Restoration of the circulation in shock is essential. Since shock cannot be recognized with certainty by clinical observations, treatment with transfusion of blood or infusion of plasma should be given to many patients with disturbances of water and electrolyte who might recover without these therapeutic measures.

The following general principles are used in planning therapy: (1) treatment of shock by infusion of solutions replacing the deficit of electrolyte and blood transfusions or infusions of plasma or human plasma albumin; (2) replacement of deficit of electrolyte with solutions which provide for the restoration of sodium, potassium, chloride and phosphate, as indicated by the estimated deficiencies; (3) provision of water and electrolyte to cover the expenditure as calculated from the metabolic rate and abnormal losses; (4) appropriate therapy to overcome abnormal metabolic reactions, as in diabetes, adrenal insufficiency, renal failure and diarrhea, and (5) avoidance of disturbances produced by the solutions used. According to the chief purpose for which they are appropriate, the various solutions may be grouped in four categories: (1) provision of water, (2) replacement of electrolytes, (3) maintenance of nutrition and (4) prevention and treatment of shock.

FLUIDS APPROPRIATE FOR FURNISHING WATER

Parenteral water is most effectively given by the intravenous injection of a 5 or 10 per cent solution of dextrose in water. Although 5 per cent dextrose is frequently given by hypodermoclysis, this practice is seldom desirable since 5 per cent dextrose is irritating

locally and immobilizes water and electrolyte for a period of seven or more hours.[32] The immobilization of water and electrolyte can produce all the signs and symptoms of dehydration. One part of isotonic sodium chloride solution added to one or two parts 5 per cent dextrose has few of these objections. The rate of intravenous injection should not be greater than the body can handle. The slow injection of 5 to 10 per cent dextrose in amounts which cover water expenditure does not give more dextrose than can be metabolized. One hundred cubic centimeters of 5 per cent dextrose per 100 calories metabolized supplies sufficient dextrose to produce maximal protein sparing and to eliminate ketosis and achieve the conservation of extracellular fluid due to dextrose.[52a] Ten per cent is as high a concentration as is well tolerated by the veins over long periods. Dextrose solutions should be made up in water for most purposes. In planning the total fluid intake

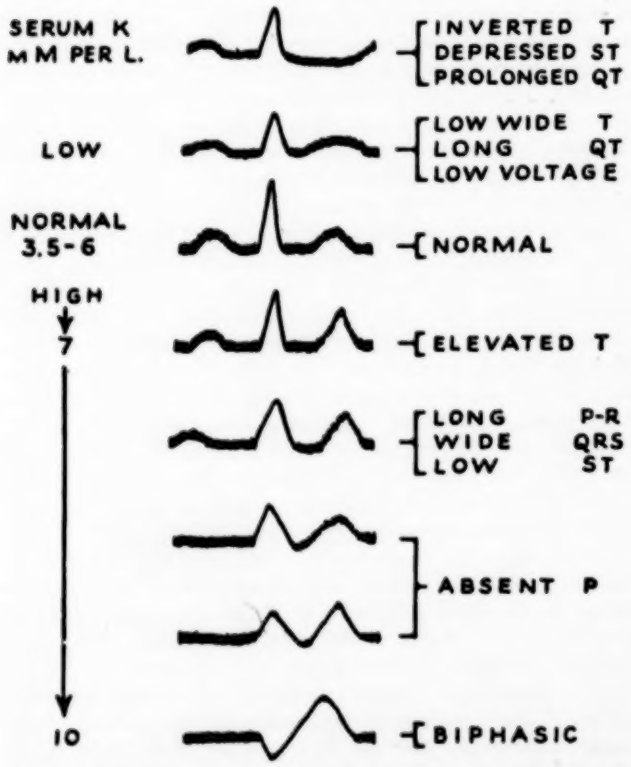

Fig. 6.—Diagrammatic representation of the changes in the electrocardiogram associated with the changes in the concentration of potassium in serum.

for twenty-four hours, it is appropriate to add dextrose in water to isotonic sodium chloride solution and other solutions containing electrolyte. However, the electrolyte should be administered in quantities appropriate for replacement of deficits and expenditure of electrolyte. Since isotonic sodium chloride solution requires about one fourth to one half of its water to excrete the salt in the urine, sodium chloride solutions should not be regarded as a means of supplying more than a minor part of the water requirement. Except during the first twenty-four hours of treatment, when a large deficit of electrolyte is being replaced, the total mixture given over a period of twenty-four hours should not contain more than one-third isotonic electrolyte.

FLUIDS FOR REPLACEMENT OF ELECTROLYTE

Isotonic sodium chloride solution is the basic solution in this category because it appropriately contains the principal ions of extracellular fluids and is easily sterilized. It contains relatively more chloride than extracellular fluids. A mixture of two or three parts isotonic sodium chloride solution and one part isotonic (sixth-molar) sodium lactate solution more nearly resembles interstitial fluid. Hartmann's lactated Ringer's solution and a suitable mixture of sodium chloride and sodium bicarbonate imitate interstitial fluid quite closely. Isotonic sodium lactate injection is given primarily to replace a deficit of sodium relatively greater than the deficit of chloride. Deficit of sodium is probably never greater than 12 ml. of molar sodium lactate per kilogram of body weight or the equivalent amount of sodium bicarbonate (1 Gm.). Seventy milliliters per kilogram of body weight is therefore the maximum dose of sixth-molar sodium lactate for immediate replacement over a short period. It is probably seldom, if ever, advisable to use this much sodium lactate or the equivalent amount of sodium bicarbonate, but larger doses may be required over a period of several days if sodium loss continues. The treatment of metabolic acidosis with excessive amounts of sodium bicarbonate or sodium lactate, particularly if deficit of potassium is not replaced, may produce alkalosis and tetany. It has been shown that signs and symptoms of tetany do not occur when the concentration of calcium in serum is at levels usually accompanied by tetany if the concentration of potassium is abnormally low. Restoring the level of serum potassium to normal may induce tetany if the serum calcium remains low. For this reason attention must be paid to the possibility of low concentrations of both calcium and potassium occurring in the same patient.[78] Ionic solutions containing chiefly sodium and chloride produce no toxic ionic effects and diffuse rapidly out of the vascular compartment into the interstitial fluids. They may be injected as rapidly as 30 ml. per kilogram of body weight per hour except when there are cardiac or other contraindications to rapid infusion.

The solution containing sodium chloride, sodium lactate and potassium chloride developed by Darrow (called "K-lactate") contains sodium and chloride in the ratio of interstitial fluid together with an amount of potassium which is unlikely to raise the serum concentration of potassium to toxic levels when the solution is injected over a period of four or more hours in amounts which give appropriate amounts of sodium and chloride. It contains 4.0 Gm. of sodium chloride, 2.7 Gm. of potassium chloride and 52 ml. of molar sodium lactate per liter. The concentration of potassium is about ten times as great as that of serum. In order to avoid the danger of potassium intoxication, it should be injected, preferably subcutaneously, over a period of four or more hours for the dose appropriate for one day. Theoretically and practically, it is not necessary to give more than 80 ml. per kilogram in order to replace a maximum deficit of extracellular electrolyte. The deficits of potassium are often so large that they cannot be restored parenterally in less than six days because of the dangers of more rapid parenteral administration of potassium and because administration of more potassium does not restore cell deficits more rapidly.[79] "K-lactate" may be injected slowly into the veins or subcutaneously. If given intravenously, one part of the "K-lactate" solution should be diluted with two or three parts of 5 or 10 per cent dextrose in water. Butler and Talbot [80] have advocated a solution for intravenous use that is similar to "K-lactate" diluted with two parts 5 or 10 per cent dextrose in water. This solution contains 5 millimoles of phosphate per liter and is appropriate for diabetic coma and may have advan-

tages in diarrhea and other conditions. Since acidosis is usually dependent on loss of potassium as well as sodium, solutions containing potassium as well as sodium salts are practically always indicated in acidosis. In the acidosis of diarrhea, it has seldom seemed necessary to administer sodium bicarbonate or sodium lactate in addition to that contained in the "K-lactate" solution. Since the dehydration of diarrhea probably presents as severe a depletion of electrolyte as is found in any condition, this solution should be equally effective in other types of acidosis (such as diabetic acidosis and nondiabetic ketosis). Potassium-containing solutions should not be used in Addison's disease and should be used only in appropriate cases of renal acidosis.

In alkalosis with potassium depletion as well as relative deficit of chloride in relation to sodium, theoretic considerations indicate that a mixture containing about 6 Gm. of sodium chloride and 2.7 Gm. of potassium chloride per liter should be more effective than isotonic sodium chloride solution. Such a solution may be injected subcutaneously at a slow rate but should be diluted with two or three parts 5 or 10 per cent dextrose in water if injected into the veins. N. K. Ordway informs us that he has successfully used higher concentrations of potassium and equal parts of isotonic sodium chloride and potassium chloride. Ammonium chloride has been injected intravenously in severe alkalosis.[81] While this therapy is effective in hastening the restoration of the concentration of bicarbonate in serum, it fails to correct the deficiency of potassium which is the cause of the ineffectiveness of isotonic sodium chloride solution in refractory alkalosis.

FLUIDS FOR PARENTERAL FEEDING

Parenteral feeding is limited to vitamins and solutions of dextrose and amino acids, since intravenous injection of fats is still experimental. Amino acids and protein hydrolysates may supply the protein needs when combined with dextrose. About 2 Gm. per 100 calories metabolized is the usual amount given in twenty-four hours, that is, about 1 Gm. per kilogram in adults and 2.5 Gm. per kilogram in infants. The amino acids are usually combined with dextrose, water and electrolyte so as to meet all the expenditure of water and electrolyte. A mixture of 2 Gm. of amino acids in 150 ml. of 10 per cent dextrose yields about 68 calories, while 2 Gm. in 225 ml. of 10 per cent dextrose yields 100 calories. These units are appropriate amounts to be given per estimated 100 calories metabolized. Both supply the water requirement, but only the latter meets the caloric expenditure.

SOLUTIONS FOR THE PREVENTION OR TREATMENT OF SHOCK

Compatible whole blood in amounts of 30 ml. per kilogram of body weight for an infant to half that amount for an adult is, in general, the most effective agent for the prevention or treatment of shock. Whole blood is indicated to sustain red cells and plasma volumes and to add to the oxygen-carrying capacity of the vascular compartment. The red cells have important functions in carbon dioxide transport and in the buffer effect of hemoglobin. In dehydration due to loss of electrolytes the effectiveness of the appropriate electrolyte solution is enhanced if blood (or plasma) is also administered.[36] The prejudice against giving whole blood in dehydration is unfounded experimentally, and, when accompanied by proper quantities of water and electrolyte solutions, the administration of whole blood has clinically demonstrated its value.[82]

Plasma, either separated from cells or reconstituted from lyophilized plasma, has the advantage of greater availability but is somewhat inferior to whole blood except in a few conditions. Because of the dangers of hepatitis, irradiated plasma or plasma derived from a single donor is much safer than pooled plasma. Human serum albumin given in its concentrated form has a greater effect on the oncotic pressure in the vascular compartment than plasma or whole blood and does make it possible to supply relatively large amounts of serum albumin to patients. The following paragraphs will illustrate how certain situations are met when patients are unable automatically to meet fluid requirements.

The need to administer all fluids parenterally arises frequently in all fields of medicine but particularly in the postoperative care of surgical patients. Since only sodium chloride solutions are well tolerated when injected subcutaneously, all or a large part of the water requirement must be given by vein. The most convenient method of injection is infusion of appropriate solutions through intravenous drip. The solutions required should be carefully calculated to fulfil the needs for twenty-four hours, and the rate of injection should be regulated with due consideration for the comfort of the patient and the dangers of too rapid injection. When there are no abnormal losses or shock, the requirement of electrolyte is small, probably not over 10 to 20 ml. of isotonic sodium chloride solution per 100 calories metabolized. After operative procedures the kidneys tend to conserve both water and sodium chloride.[83] For this reason it usually is desirable to limit the intake of water and salt to the requirements for low urine losses. Furthermore, adding sodium chloride to dextrose solutions leads to retention of sodium and excretion of potassium.[83] The amount of electrolyte released by the catabolism of tissues during fasting may be sufficient to cover obligatory expenditure in many patients. Five grams of dextrose per 100 calories metabolized will induce maximal sparing of protein. Further protection of body protein can only be obtained by the addition of 2 to 3 Gm. of amino acids together with sufficient dextrose to cover the caloric expenditure. The calculation of the total fluid requirement is indicated in the previous section, in which the factors controlling water expenditure are discussed. For each 100 calories metabolized, water requirement lies between 90 and 125 ml. Ten to twenty milliliters may be given as isotonic sodium chloride solution or as "K-lactate" and the rest as 5 or 10 per cent dextrose in water. Two grams of amino acids may be added to the fluid in appropriate cases. A 5 Kg. infant metabolizing 500 calories would require between 450 and 625 ml. of a suitable mixture, while an adult would need between 1,600 and 2,250 ml. In addition to the minimal requirement of water and electrolyte, patients with abnormal losses of water, sodium, chloride and potassium may require treatment for shock, replacement of the deficits and provision for continuing losses of water and electrolyte. The fluids used will vary considerably according to the initial serum electrolyte concentrations, the disturbances in acid-base equilibrium, the age and the amount and kind of abnormal losses.

When there are profound circulatory disturbances and shock, the initial treatment should be infusion of 20 to 30 ml. per kilogram of body weight of a solution containing chiefly sodium chloride. If there is metabolic

acidosis, a mixture of one part isotonic sodium lactate and two parts isotonic sodium chloride solution is better than sodium chloride alone, though the latter is usually effective. Blood transfusions should follow as soon as possible in severe cases. Plasma may be used in the place of blood and sodium chloride when blood is not available. In metabolic alkalosis the same initial plan of therapy is followed except that isotonic sodium chloride solution is the appropriate solution. In both acidosis and alkalosis the replacement of potassium as well as of sodium and chloride may be started as soon as the circulation has improved and urine is being formed.

The deficit of extracellular electrolyte is seldom greater than one third of the normal content, even in the most severe dehydration. Hence, with babies with severe losses of water and electrolyte, the deficiency of sodium and chloride is restored by 80 ml. per kilogram of body weight of the appropriate solution containing these ions at about physiologic concentration. Seventy milliliters per kilogram suffices for adults. Smaller amounts are required in less severe cases. The deficit of water is replaced by the appropriate sodium chloride solution together with the water given to cover obligatory expenditure. The deficits of potassium may reach half the total muscle content in experimental animals or about 25 millimoles per kilogram of body weight. Probably 15 millimoles of potassium per kilogram of body weight is encountered in patients. A large deficit probably cannot be replaced in less than four to six days, since the cells do not repair this deficiency rapidly. Although as much as 7 milliequivalents of potassium per kilogram has been given parenterally, 3 milliequivalents (0.22 Gm. of potassium chloride) per kilogram per day is as much as is safe and efficiently utilized.

In acidosis, deficit of extracellular electrolyte is usually satisfactorily replaced by a mixture of one part isotonic sodium lactate and two parts isotonic sodium chloride solution. Since, in most instances, acidosis is accompanied by potassium deficit, "K-lactate" usually is more appropriate. In diabetes and perhaps in other conditions, the addition of about 0.7 Gm. potassium dihydrogen phosphate per liter, as advocated by Butler and Talbot, is advantageous. Isotonic sodium chloride solution is usually effective in alkalosis, but, if vomiting has been prolonged or postoperative suction is being carried out, the solution containing 6 Gm. of sodium chloride and 2.7 Gm. of potassium chloride is indicated. Any of these solutions may be injected subcutaneously, but, if given intravenously, the solutions containing potassium should be diluted with two or three parts of 5 or 10 per cent solution of dextrose in water. Potassium-containing solutions should be given over a period of four or more hours in either instance. If given subcutaneously, appropriate amounts of dextrose in water should be injected intravenously unless sufficient water is taken by mouth. After replacement of the initial deficit of water and electrolyte, the continuing losses can be replaced and the obligatory expenditure covered by administration of 125 to 150 ml. per 100 calories metabolized of a mixture of one part of the appropriate electrolyte solution and two or three parts 5 or 10 per cent dextrose in water. As long as there is deficit of water and electrolyte, oral feeding is likely to induce vomiting and may aggravate diarrhea. After the initial deficits of water and electrolyte are replaced, solutions containing water and electrolyte are often well tolerated orally and may be given before food can be ingested.

In infantile diarrhea, milk feeding increases the loss of water and electrolyte in the stools and should be omitted for twenty-four hours or until one is assured that milk will not lead to vomiting or greatly increase the bulk of the stools. Food should be started by giving 10 to 20 calories per kilogram of a suitable milk mixture diluted with sufficient water to cover a high rate of expenditure (150 ml. per kilogram). With the total intake of water kept constant, the proportion of milk should gradually be increased over a period of five to twelve days until full caloric feeding is given (100 calories per kilogram). One gram of potassium chloride should be added to each day's food when the milk mixture is providing less than 70 calories per kilogram per day. Most infants with severe dehydration in diarrhea should receive transfusions. Provision for more sodium lactate or bicarbonate than is obtained from "K-lactate" is seldom, if ever, necessary to overcome the acidosis in infantile diarrhea. Adults may be treated similarly by basing the amounts of fluid for expenditure on the estimated caloric production.

Treatment of diabetic acidosis requires the proper replacement of deficits of water, sodium, chloride, potassium and phosphate as well as the administration of insulin. Blood transfusions are seldom necessary. "K-lactate" fortified with phosphate is indicated for replacement of electrolyte. Dextrose in water is indicated to provide water for obligatory water expenditure as long as fluid cannot be taken orally. When the blood sugar is high, the injection of dextrose may be delayed for an hour or two until the effect of insulin injection is taking place. Broth and diluted fruit juices may be taken early in diabetic acidosis, and both provide considerable potassium. Broth should contain sodium chloride at about one-fourth physiologic strength (2.25 Gm. sodium chloride per liter).

Deficiency of sodium and chloride but not potassium develops in the patient with adrenal insufficiency. A mixture of one part isotonic sodium lactate solution and two parts isotonic sodium chloride solution may be used to replace the deficit of electrolyte. Solutions containing large amounts of potassium should not be given. Dextrose solutions are essential for support of the blood sugar, as well as for provision of water. Desoxycorticosterone acetate corrects the disturbance in renal function but does not replace the other functions of the adrenal glands. Large doses of cortical extract are the only means of fully replacing the adrenocortical functions. At present, the adrenocortical extracts do not contain sufficient active steroids completely to fulfil the functions of the adrenal glands except in large amounts and at prohibitive costs.

Most patients with gastric alkalosis are satisfactorily treated with isotonic sodium chloride solution. However, potassium deficiency will have developed in a number who will require both potassium and sodium chloride. Surgical patients subjected to duodenal drainage require replacement of potassium as well as sodium chloride. The possibility of potassium deficiency as the primary cause of metabolic alkalosis should always be borne in mind. This phenomenon is encountered in certain patients with adrenocortical tumors, patients receiving desoxycorticosterone acetate and sodium chloride, patients with chronic diarrhea who take little food and patients who have recovered from

acidosis accompanied by potassium deficiency and who were treated with sodium salts while they were unable to take adequate amounts of food. If electrolyte concentration is high, little or no electrolyte solution may be required. Fluids should consist chiefly of intravenously administered dextrose in water.

The treatment of acidosis seldom requires fluids containing more sodium bicarbonate or sodium lactate than is contained in one part isotonic sodium lactate solution and two parts isotonic sodium chloride solution or "K-lactate" (80 cc. per kilogram for the most severe types). If insufficient water is given when isotonic sodium chloride solution alone is used, acidosis may be aggravated, particularly if there is deficit of potassium as well as of sodium and chloride. If sodium lactate is given in severe acidosis, the amount should be about 5 to 10 ml. of molar sodium lactate per kilogram. This may be given intravenously at third-molar or fourth-molar concentration if one is dealing with hypotonic dehydration. In hypertonic dehydration, sixth-molar is the best concentration for intravenous injection. Sodium lactate injection may be given subcutaneously after dilution to sixth-molar concentration.

The treatment of edema is directed primarily toward the factors producing edema, such as the low concentration of albumin, heart failure and renal disease. Purified low sodium albumin is the most effective diuretic in patients with low serum albumin. When edematous patients have low electrolyte concentration, renal and circulatory functions may sometimes be improved by restoring the sodium concentration with the intravenous injection of 2 or 3 per cent solution of sodium chloride. However, restriction of salt is advantageous in most types of edema. On the other hand, if water intake has been restricted, Schemm [84] points out that diuresis is most likely to occur when the intake of water is increased, salt restricted and the diet yields a neutral or acid ash. To be effective, Schemm emphasizes that the water intake must be extremely high (4,000 ml. in adults). It is probable that the effectiveness of Schemm's treatment is dependent on the avoidance of conditions leading to a concentrated urine. Acidosis in edematous nephritic patients may require the oral or intravenous administration of sodium bicarbonate or lactate. Such treatment is instituted with reluctance since the intake of sodium bicarbonate aggravates the edema.

SUMMARY

The first two sections discuss the relation of the vascular to the extracellular compartments and the composition of the body as a whole. The changes in composition taking place in dehydration, acidosis and alkalosis, the changes in electrolyte concentration and the changes in the volume of extracellular fluids are described. Emphasis is placed on alterations in intracellular as well as extracellular fluids. Changes in the relation of body sodium, potassium and chloride are related to the acid-base equilibrium as well as to changes in hydration and water distribution. The third section discusses the factors controlling expenditure of water and electrolyte. Normal water expenditure is closely correlated to heat production and urinary concentration. Sweat volume is related to heat balance. The abnormal losses occurring in the urine, stools, vomitus and other gastrointestinal secretions are described. The fourth and fifth sections describe the symptoms and diagnosis of hypokaliemia and deficiency of potassium and hyperkaliemia. The sixth section discusses fluid therapy in the light of the concepts developed in the previous sections. It is pointed out that the aim of fluid therapy is to restore and maintain the normal composition of the tissues.

REPORT OF THE COUNCIL

The following statement has been accepted by the Council on Foods and Nutrition. JAMES R. WILSON, M.D., *Secretary.*

ASCORBIC ACID CONTENT OF GRAPEFRUIT JUICE

The Council on Foods and Nutrition has recognized for many years the importance of making available dependable sources of vitamin C. The value of citrus fruit as a source of vitamin C is well known, and at the present time the Council considers for acceptance orange juice having a natural ascorbic acid content of at least 40 mg. per hundred milliliters when packed.

In order to encourage the production and use of other citrus fruit juices containing high natural levels of ascorbic acid, the Council has decided to consider for acceptance grapefruit juice and blends of grapefruit juice and orange juice. After a study of what might reasonably be expected from a high grade fruit, carefully selected and processed by one of the modern methods, the Council decided to consider for acceptance grapefruit juice having a natural ascorbic acid content of at least 30 mg. per hundred milliliters. The ascorbic acid value for acceptable orange and grapefruit juice blends will, of course, be dependent on the proportion of each juice in the mixture.

ACCEPTED FOODS

The following products have been accepted as conforming to the rules of the Council. JAMES R. WILSON, M.D., *Secretary.*

Richmond-Chase Company, San Jose, Calif.

DIET-DELIGHT BRAND HALVES UNPEELED APRICOTS consists of the fruit itself, packed in water without any added sugar or salt.

Analysis (submitted by manufacturer).—Moisture 89.8%, ash 0.4%, fat 0.07%, protein 0.5%, available carbohydrates (total sugar as invert) 6.3%, carbohydrates by difference 8.8%, crude fiber 0.4%.

Calories.—0.28 per gram; 7.9 per ounce.

Use.—For use in calory-restricted diets.

DIET-DELIGHT BRAND HALVES BARTLETT PEARS consists of the fruit itself, packed in water without any added sugar or salt.

Analysis (submitted by manufacturer).—Moisture 92.1%, ash 0.2%, fat 0.2%, protein 0.3%, available carbohydrates (total sugar as invert) 5.9%, carbohydrates by difference 6.1%, crude fiber 1.1%.

Calories.—0.27 per gram; 7.7 per ounce.

Use.—For use in calory-restricted diets.

DIET-DELIGHT BRAND HALVES YELLOW CLING PEACHES consists of the fruit itself, packed in water without any added sugar or salt.

Analysis (submitted by manufacturer).—Moisture 90.5%, ash 0.3%, fat 0.02%, protein 0.4%, available carbohydrates (total sugar as invert) 4.9%, carbohydrates by difference 8.5%, crude fiber 0.3%.

Calories.—0.22 per gram; 6.3 per ounce.

Use.—For use in calory-restricted diets.

DIET-DELIGHT BRAND SLICED YELLOW CLING PEACHES consists of the fruit itself, packed in water without any added sugar or salt.

Analysis (submitted by manufacturer).—Moisture 90.5%, ash 0.3%, fat 0.02%, protein 0.4%, available carbohydrates (total sugar as invert) 5.0%, carbohydrates by difference 8.5%, crude fiber 0.3%.

Calories.—0.22 per gram; 6.3 per ounce.

Use.—For use in calory-restricted diets.

DIET-DELIGHT BRAND FRUIT COCKTAIL consists of peaches, pears, grapes, pineapple and artificially colored and flavored cherries packed in water without any added sugar or salt.

Analysis (submitted by manufacturer).—Mosiure 88.9%, ash 0.3%, fat 0.1%, protein 0.6%, available carbohydrates (total sugar as invert) 6.6%, carbohydrates by difference 9.6%, crude fiber 0.5%.

Calories.—0.31 per gram; 8.7 per ounce.

Use.—For use in calory-restricted diets.

Council on Physical Medicine and Rehabilitation

REPORT OF THE COUNCIL

The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

HOWARD A. CARTER, *Secretary.*

SIGHT-SCREENER, MODEL 1235, ACCEPTED

Manufacturer: American Optical Company, Southbridge, Mass.

The Sight-Screener is a portable vision-testing instrument with which suitably trained technicians can test groups of persons and can secure data useful to a professional worker in determining whether a person tested should be advised to secure a professional ophthalmologic examination. The instrument is designed to stand on a table while the patient sitting before it observes a succession of test fields through two polarizing viewers located in the face of the instrument.

Sight-Screener

The following information can be obtained by using this instrument: (1) indication of tendency to see binocularly, to suppress one eye or the other, or to see alternately with one eye and then with the other; (2) measure of acuity of right eye; (3) measure of acuity of left eye; (4) measure of acuity of both eyes; (5) degree of stereopsis; (6) tendencies to right or left hyperphoria, and (7) tendencies to exophoria or esophoria. This information is obtained both at the optical equivalent of 20 feet and at an actual 14 inch distance.

The manufacturer supplied the following data:

	Metric	English
Dimensions, unpacked,	length, 51 cm.	20 inches
	height, 43 cm.	17 inches
	width, 23 cm.	9 inches
Weight, unpacked	10 Kg.	22 pounds
Dimensions, packed,	length, 56 cm.	22 inches
	height, 48 cm.	19 inches
	width, 30.5 cm.	12 inches
Weight, packed for domestic shipment	22 Kg.	49 pounds
Weight, packed for foreign shipment	43 Kg.	95 pounds

The device requires a source of either alternating or direct current at 115 volts and draws 50 watts.

Evidence from sources acceptable to the Council indicated that this device was sound in principle and satisfactory in construction. The Council on Physical Medicine and Rehabilitation voted to include the Sight-Screener, Model 1235, in its list of accepted devices.

AIRCO OXYGEN THERAPY REGULATOR, NOS. 806-8480 AND 806-8482, ACCEPTED

Manufacturer: Air Reduction Company, Inc., Research Laboratories, Murray Hill, N. J.

These two devices are alike in that they are two-stage regulators equipped with gages for indicating both the rate of flow of the oxygen (up to 15 liters per minute) and the residual-cylinder content. No. 806-8480 is a two stage dial regulator. One dial shows the rate of oxygen flow, the other shows the pressure in the tank. This regulator has the following over-all dimensions: 20 by 18 by 14 cm. (8 by 7 by 5½ inches). The net, legal, domestic shipping and foreign shipping weights are, respectively, 2.6, 2.9, 3.2 and 5.0 Kg. (5 lbs. 12 oz., 6 lbs. 6 oz., 7 lbs. and 11 lbs.).

No. 806-8482 is used on medical oxygen cylinders. It therefore needs an adaptor for use with commercial oxygen. It has a float type of flowmeter and may be used with or without a humidifier. It has the following over-all dimensions: 23 by 20 by 15 cm. (9 by 8 by 6 inches). The net weight, legal weight, domestic shipping weight and foreign shipping weight

Airco Oxygen Therapy Regulator No. 806-8480

Airco Oxygen Therapy Regulator No. 806-8482

are, respectively, 2.6, 2.9, 3.3 and 5.4 Kg. (5 lbs. 10 oz., 6 lbs. 6 oz., 7 lbs. 6 oz. and 12 lbs.).

In both regulators the face of the pressure dial carries two volume scales for indicating cylinder contents in liters (referring to a temperature base of 70 F. and a pressure of one atmosphere). The outer scale (0-6,000) refers to the content in liters when using a "220 cu. ft." cylinder of oxygen. The other scale (0-3,000) refers to the contents in liters when using "110 cu. ft." cylinder. Each regulator is provided with a safety valve for relieving excessive pressures. The action of this safety release is always preceded or accompanied by a protrusion of the signal button from the back cap of the regulator.

During prolonged clinical use, both devices fulfilled the manufacturer's claims. The Council on Physical Medicine and Rehabilitation therefore voted to include the Airco Oxygen Therapy Regulator, Nos. 806-8480 and 806-8482, in its list of accepted devices.

ZENITH MINIATURE 75 HEARING AID ACCEPTED

Manufacturer: Zenith Radio Corporation, 6001 Dickens Avenue, Chicago 39.

The instrument is used to aid a deafened person to hear better. The front and back covers are metal. The lower half of the back swings upward to expose the battery compartment. The wheel-type volume control and off switch is at one upper, back corner and a wheel-type tone control with four positions is at the other upper corner. The receiver cord is a two conductor, plastic-insulated cord molded into a single unit. It is reversible and is reinforced with plastic tubing at its terminals.

Zenith Miniature 75 Hearing Aid

The outside dimensions of the instrument, without the clothing clip, are as follows: 100 mm. long, 60 mm. wide and 23 tapering to 20 mm. thick. The weight with batteries, receiver and cord is 189 Gm. Exclusive of batteries the weight is 124 Gm. Receiver and cord alone weigh 9 Gm. The hearing aid requires zinc-carbon batteries, an A-battery at 1.5 volts and a B-battery at 22.5 volts. It is claimed that the drain on the A-battery at 1.25 volts is 30 milliamperes and on the B-battery at 22.5 volts, 0.4 milliamperes. The batteries and three vacuum tubes are readily removable for replacement.

Evidence from a laboratory acceptable to the Council indicated that the specimen submitted gave satisfactory results in acoustical performance tests and that it was well constructed. The Council on Physical Medicine and Rehabilitation voted to include the Zenith Miniature 75 Hearing Aid in its list of accepted devices.

MEDICAL LICENSURE STATISTICS FOR 1949

FORTY-EIGHTH ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Donald G. Anderson, M.D., Secretary, and Anne Tipner

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This report is the forty-eighth annual compilation of information and statistics pertaining to medical licensure in the United States, its territories and outlying possessions by the Council on Medical Education and Hospitals of the American Medical Association.

The report presents statistics referring to medical examining and licensing boards of all states, Alaska, Hawaii, Puerto Rico and the Virgin Islands. The figures for Connecticut and Louisiana also include data reported by the homeopathic medical examining boards of those states.

As in previous years, there is included data pertaining to the National Board of Medical Examiners and the boards of examiners in the basic sciences.

The compilations included in this study are obtained from official reports. The Council and THE JOURNAL express their appreciation to the officers of the examining and licensing agencies for these data and for other records furnished throughout the year to the office of the Council.

The tables referring to medical licensure include figures for the number of candidates examined for medical licensure in 1949 and also for those licensed on the basis of reciprocity or endorsement of credentials. There are also included other pertinent data pertaining to the regulations for medical licensure of physicians who secured their professional training in the United States and Canada and also for physicians trained in other countries. The state boards are discussed first, followed by the basic science boards and the National Board of Medical Examiners.

STATE BOARDS OF MEDICAL LICENSURE

Licenses Issued

During the year 1949 there were 12,181 licenses to practice medicine issued by the medical examining boards of the 48 states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands. The numbers licensed in each state, by examination or by the endorsement of credentials, is shown in table 1. Of the 12,181 licenses issued, 5,252 were granted after written examination and 6,929 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners.

It does not follow that all physicians certified after examination were tested in a given year. In 23 states, the District of Columbia, Alaska, Hawaii, Puerto Rico

TABLE 1.—*Licenses Issued, 1949*

	Examination	On the Basis of Reciprocity and Endorsement	Total
Alabama	16	88	104
Arizona	22	77	99
Arkansas	52	39	91
California	484	1,027	1,511
Colorado	78	83	161
Connecticut	32	197	229
Delaware	21	10	31
District of Columbia	30	197	227
Florida	325	0	325
Georgia	109	70	179
Idaho	37	15	52
Illinois	370	220	590
Indiana	98	139	237
Iowa	64	132	196
Kansas	99	86	185
Kentucky	86	72	158
Louisiana	164	86	250
Maine	25	44	69
Maryland	178	123	301
Massachusetts	70	319	389
Michigan	196	215	411
Minnesota	184	128	312
Mississippi	34	61	95
Missouri	194	122	316
Montana	8	36	44
Nebraska	52	47	99
Nevada	4	26	30
New Hampshire	7	66	73
New Jersey	76	270	346
New Mexico	4	44	48
New York	411	1,041	1,452
North Carolina	88	128	216
North Dakota	24	24	48
Ohio	290	278	568
Oklahoma	70	61	131
Oregon	47	103	150
Pennsylvania	397	247	644
Rhode Island	15	25	40
South Carolina	43	40	83
South Dakota	10	29	39
Tennessee	140	78	218
Texas	145	292	437
Utah	31	38	69
Vermont	14	34	48
Virginia	110	123	233
Washington	71	153	224
West Virginia	61	53	114
Wisconsin	109	86	195
Wyoming	1	16	17
Alaska, Hawaii, Puerto Rico and Virgin Islands	56	41	97
Totals	5,252	6,929	12,181

Marginal Number	SCHOOL	Alabama P	Alabama F	Arizona P	Arizona F	Arkansas P	Arkansas F	California P	California F	Colorado P	Colorado F	Connecticut P	Connecticut F	Delaware P	Delaware F	Dist. of Columbia P	Dist. of Columbia F	Florida P	Florida F	Georgia P	Georgia F	Idaho P	Idaho F	Illinois P	Illinois F	Indiana P	Indiana F	Iowa P	Iowa F	Kansas P	Kansas F	Kentucky P	Kentucky F	Louisiana P	Louisiana F	Maine P	Maine F	Maryland P	Maryland F	Massachusetts P	Massachusetts F	Michigan P	Michigan F	Minnesota P	Minnesota F
	ALABAMA																																												
1	Medical College of Alabama, Birmingham	29	0															1	0							1	0																		
	ARKANSAS																																													
2	University of Arkansas School of Medicine, Little Rock					51	0	1	0									4	0					1	0																				
	CALIFORNIA																																												
3	University of California Medical School, San Francisco							64	1									1	0																					1	0		2	0
4	Coll. of Medical Evangelists, Loma Linda-Los Angeles			1	0			80	7	1	0							9	0			4	0	1	0																1	0		
5	Univ. of So. California School of Med., Los Angeles			1	0			54	0															1	0																				
6	Stanford University School of Medicine, Stanford University-San Francisco							50	2			1	0											1	0																			1	0	1	0
	COLORADO																																												
7	University of Colorado School of Medicine, Denver			1	0			3	1	49	0									3	0			1	0			1	0											1	0				
	CONNECTICUT																																												
8	Yale University School of Medicine, New Haven									1	0	2	0	1	0			1	0					1	0													1	0						
	DISTRICT OF COLUMBIA																																												
9	George Washington Univ. School of Med., Washington							5	1			1	0	1	0	5	0	6	0															1	0							2	0		
10	Georgetown University School of Med., Washington							1	0							2	0	4	0																	2	0	3	0	0	2			1	0
11	Howard University College of Medicine, Washington									1	0	9	0	1	0	1	0			4	0													1	0			11	2			1	0		
	GEORGIA																																												
12	University of Georgia School of Medicine, Augusta																	7	0	6	1	4		1	0																				
13	Emory University School of Med., Emory University											1	0					21	0	37	0			2	0																				
	ILLINOIS																																												
14	Northwestern University Medical School, Chicago	1	0	3	0			12	0	1	0							3	0			2	0	6	1			1	0			1	0							1	0	3	0	1	3	0
15	Stritch School of Med. of Loyola University, Chicago			1	0			0	1									4	0			1	0	3	5	0	3	1	2	0										2	0	1	0	2	0
16	University of Chicago, The School of Med., Chicago							7	0	1	0					1	0					2	0	2	5	0	1	0									5	0			3	0	8	0		
17	University of Illinois College of Medicine, Chicago	1	0	3	0			19	0	4	0					1	0	7	0			1	0	8	8	2	2	0	1	0	3	0	2	0	1	0					8	0	7	0
	INDIANA																																												
18	Indiana University School of Medicine, Bloomington-Indianapolis							3	0									7	0					1	0	7	8	2													1	0	1	0	3	0
	IOWA																																												
19	State University of Iowa College of Med., Iowa City			1	0			4	0	1	0							2	0					3	0			37	0													1	0		
	KANSAS																																												
20	Univ. of Kansas School of Med., Lawrence-Kansas City							5	1															1	0					82	0													7	0
	KENTUCKY																																												
21	University of Louisville School of Medicine, Louisville							1	1									14	1			1	0	1	0							77	0									1	0		
	LOUISIANA																																												
22	Louisiana State Univ. School of Medicine, New Orleans							4	0									1	0					1	0									51	0										
23	Tulane University of Louisiana School of Medicine, New Orleans	1	0					4	0									9	0					1	0									92	0										
	MARYLAND																																												
24	Johns Hopkins University School of Med., Baltimore	1	0											1	0			4	0	2	0																			6	3	0			2	0
25	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore											1	0	1	0			1	0					1	0															4	8	0			3	0
	MASSACHUSETTS																																												
26	Boston University School of Medicine, Boston									1	0							1	0																							1	0	1	0	
27	Harvard Medical School, Boston	2	0					2	0									5	0					2	0					1	0			2	0	1	0	1	0	3	0	2	0	1	0
28	Tufts College Medical School, Boston							1	0									6	1					1	0									2	0	6	1			3	0			1	0
	MICHIGAN																																												
29	University of Michigan Medical School, Ann Arbor							6	0	1	0			1	0			6	2					2	0	1	0			1	0							1	0			8	2	0	2	0
30	Wayne University College of Medicine, Detroit							5	0									3	0			1	0	3	0																	3	6	0		
	MINNESOTA																																												
31	University of Minnesota Medical School, Minneapolis			2	0			2	1	1	0							4	0			3	0	9	1	1	0			1	0			1	0							7	9	0	
	MISSOURI																																												
32	St. Louis University School of Medicine, St. Louis							10	3									6	0					3	0																				
33	Washington University School of Medicine, St. Louis							1	0									4	0					3	0																				
	NEBRASKA																																												
34	Creighton University School of Medicine, Omaha	1	0					11	3	1	0									1	1	2	0			9	0	1	0	2	0	1	0			1	0					2	0		
35	University of Nebraska College of Medicine, Omaha							1	1											3	0	1	0					1	0															1	0
	NEW YORK																																												
36	Albany Medical College, Albany																	7	0									2	0																
37	Long Island College of Medicine, Brooklyn	1	0					2	0			2	0			1	0													1	0														
38	University of Buffalo School of Medicine, Buffalo							1	0									6	0																							0	1		
39	Columbia University College of Physicians and Surgeons, New York			1	0			1	0									7	0			1	0											1	0			1	0	2	0		
40	Cornell University Medical College, New York			1	0			3	0					1	0	1	0	5	1			1	0											1	0	2	0	1	0	2	0		
41	New York Medical College, Flower and Fifth Avenue Hospitals, New York							3	0			1	1			1	0	1	0																					1	0				
42	New York University College of Medicine, New York									1	0	1	0					4	0					2	0	1	0													1	0			1	0
43	University of Rochester School of Medicine and Dentistry, Rochester	1	0					2	0			1	0					1	0															1	0	4	0					1	0	1	0
44	Syracuse University College of Medicine, Syracuse							1	0									1	0			3	0											1	0			2	0	1	1			1	0
	NORTH CAROLINA																																												
45	Duke University School of Medicine, Durham									1	0							13	0	1	0																								
46	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem																																									1	0		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																				

Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
																												31	31	0	0.0	3	1
1 0 1 0								3 0		1 0									0 1				1 0 1 0				1 0	67	66	1	1.5	12	2
													1 0												1 0			71	70	1	1.4	6	3
1 0								2 0		1 0			1 0						1 0									110	103	7	6.4	12	4
																							1 0					56	56	0	0.0	4	5
												1 0							1 0									58	56	2	3.4	7	6
					1 0			1 0											1 0						1 0		1 0	65	64	1	1.5	12	7
2 0						1 0																		2 0				12	12	0	0.0	9	8
2 0								1 0					1 0 1 0						2 0				1 0 1 0					31	30	1	3.2	14	9
					2 1			2 3 1 0			1 0		3 0										1 0 2 0					31	25	6	19.4	14	10
3 0								7 2 12 0					2 0		1 0							1 0					1 0	60	56	4	5.9	15	11
								3 3 1 0						1 0														81	74	7	8.6	6	12
								1 0																				62	62	0	0.0	5	13
1 0 2 0								5 2 1 0 1 0			2 0		2 0 1 0				3 0			2 6			6 0 1 0 9 0				4 1	146	142	4	2.7	26	14
					1 0			2 2			2 0		1 0 3 0									1 0	2 0 1 0 4 0				1 0	73	69	4	5.5	20	15
1 0 5 0 1 0					1 0			3 1 1 0 4 0 1 0 3 0			3 0		1 0				2 0			1 0			3 0 4 0		2 0		1 0 2 0	66	65	1	1.5	16	16
																												181	179	2	1.1	29	17
					1 0								1 0 1 0														1 0	100	98	2	2.0	11	18
											1 0		1 0															51	51	0	0.0	9	19
													1 1							7 0								105	103	2	1.9	6	20
								2 0 2 0					1 0											2 0			1 0	105	103	2	1.9	11	21
3 0								0 1					1 0															62	61	1	1.6	7	22
7 0 1 0																			1 0								3 0	119	119	0	0.0	9	23
	1 0		1 0					3 2 1 0					3 0												1 0		85	83	2	2.4	12	24
					1 0				6 0		1 0		4 0											3 0				70	70	0	0.0	11	25
																								1 0 2 0				8	8	0	0.0	7	26
	1 0		1 0					2 0 2 0						1 0								2 0		2 0				33	33	0	0.0	18	27
	1 0		1 0		1 0				1 0													1 0		1 0				28	26	2	7.1	13	28
								1 1			1 0		1 0						2 0					1 0				112	109	3	2.7	15	29
																							3 0				2 0	53	53	0	0.0	7	30
									4 0			0 1 1 0						4 1						4 0				120	116	4	3.3	15	31
8 9 0								1 2					1 0 1 0										2 0			4 1		123	117	6	4.9	9	32
7 7 0									1 0		1 0		1 0										1 0 1 0			1 0		91	91	0	0.0	10	33
	5 0																							1 0		2 0		44	40	4	9.1	14	34
	4 6 3																						1 0					58	54	4	6.9	7	35
																												9	9	0	0.0	2	36
					1 0			6 8					1 0 1 0										4 0 1 0					30	22	8	26.7	11	37
								0 1					1 0											2 0				12	10	2	16.7	6	38
2 0					2 0			8 3 1 0			1 0		2 0						2 0				1 0 2 0					38	35	3	7.9	16	39
2 0					2 0			10 1			1 0								1 0			3 0 1 0						40	38	2	5.0	17	40
					1 0			3 3 1 0 1 0														1 0						18	14	4	22.2	10	41
					4 1			7 5					1 0									1 0					1 0		31	25	6	19.4	12	42
3 0					1 0			5 3 1 0			4 0		1 0									1 0 1 0 2 0						34	31	3	8.8	17	43
								7 3			2 0		2 0															25	21	4	16.0	10	44
					1 0			2 0					1 0		1 0							1 0 1 0 1 0					1 0	24	24	0	0.0	11	45
1 0 1 0 1 0								0 1 3 2 0 1 0					1 0														39	38	1	2.6	8	46

TABLE 2.—CANDIDATES EXAMINED BY

Marginal Number	SCHOOL	1 Alabama P F	2 Arizona P F	3 Arkansas P F	4 California P F	5 Colorado P F	6 Connecticut P F	7 Delaware P F	8 Dist. of Columbia P F	9 Florida P F	10 Georgia P F	11 Idaho P F	12 Illinois P F	13 Indiana P F	14 Iowa P F	15 Kansas P F	16 Kentucky P F	17 Louisiana P F	18 Maine P F	19 Maryland P F	20 Massachusetts P F	21 Michigan P F	22 Minnesota P F
	OHIO																						
47	University of Cincinnati College of Med., Cincinnati				1 0					9 0			2 0				1 0					1 0	
48	Western Reserve University School of Med., Cleveland				1 0							1 0											
49	Ohio State University College of Medicine, Columbus		1 0		1 0					3 0													3 0
	OKLAHOMA																						
50	Univ. of Oklahoma School of Med., Oklahoma City			1 0	2 0					1 0	2 0					2 0							
	OREGON																						
51	University of Oregon Medical School, Portland				10 1					1 0		4 0			3 0	1 0							1 0 2 0
	PENNSYLVANIA																						
52	Hahnemann Med. Coll. and Hospital of Philadelphia	1 0	1 0		9 0		3 0	2 0	1 0	7 1		1 0	1 1						7	3	1 1	1 0	1 0
53	Jefferson Medical College of Philadelphia	4 0	1 0		3 0		2 1	4 0		3 0			3 0	1 0	1 0	1 0			1	0	1 0		1 0
54	Temple University School of Medicine, Philadelphia				9 0	1 0	1 0	2 0		9 0		1 0	2 0	1 0			1	0	1 0	2 0		2 0	3 0
55	Univ. of Pennsylvania School of Med., Philadelphia	1 0			2 0					7 0	1 0	1 0	2 1						1	0	1 0	5 0	1 0
56	Woman's Med. College of Pennsylvania, Philadelphia				2 0					1 0			1 0								1	0	2 0
57	University of Pittsburgh School of Med., Pittsburgh	1 0			1 0		1 0			1 0			1 0						1	0	2	0	
	SOUTH CAROLINA																						
58	Medical Coll. of the State of So. Carolina, Charleston									3 0			1 0				1	0					2 0
	TENNESSEE																						
59	University of Tennessee College of Medicine, Memphis		1 0		1 0		1 0	1 0		9 0	1 0		0 1										4 0
60	Meharry Medical College, Nashville				1 0					3 0			4 1	0 1			1	0	1 0		1	1	
61	Vanderbilt University School of Medicine, Nashville									6 0													
	TEXAS																						
62	Southwestern Medical School of the University of Texas, Dallas				1 0								1 0	1 0									1 0
63	University of Texas School of Medicine, Galveston									1 0													6 0
64	Baylor University College of Medicine, Houston				1 1								1 0										1 0
	UTAH																						
65	University of Utah School of Medicine, Salt Lake City				10 0	1 0	1 0			1 0		7 0				1	0						2 0
	VERMONT																						
66	University of Vermont College of Medicine, Burlington																						1 0
	VIRGINIA																						
67	University of Virginia Dept. of Med., Charlottesville	1 0						2 0		6 0			1 0										1 0
68	Medical College of Virginia, Richmond									5 0	1 0		2 0										
	WISCONSIN																						
69	University of Wisconsin Medical School, Madison		1 0		7 0								1 1	1 0		2 0		3 0		2 0			2 0
70	Marquette University School of Medicine, Milwaukee		2 0		10 0		1 0		1 0	3 0		1 0	3 1		1 0				1	0	0 1	3 0	3 0
	CANADA																						
71	Univ. of Alberta Faculty of Med., Edmonton, Alta.				1 0								2 1					1	0				1 0
72	Univ. of Manitoba Faculty of Med., Winnipeg, Man.				3 0	1 0											1	0					3 0
73	Dalhousie University Faculty of Med., Halifax, N. S.									1 0									1	0	1	0	
74	Univ. of Toronto Faculty of Med., Toronto, Ont.				4 0				2	0 0	1		6 2	2 0			1	0	1 0	2 0	1 1		1 0
75	Queen's University Faculty of Med., Kingston, Ont.				3 0				1	0			2 0				1	0	1 0	1	0		1 0
76	University of Western Ontario Faculty of Medicine, London, Ont.												1 0					1	0				
77	McGill University Faculty of Medicine, Montreal, Que.				6 1		1 0	2 0		3 0			1 0					3	0		0 1		
78	Univ. of Montreal Faculty of Medicine, Montreal, Que.																0	1					
79	Laval University Faculty of Medicine, Quebec, Que.																	1	0		1 0		
	OTHERS																						
80	Foreign Medical Faculties				34 31	7 0	6 7		5	1 10	3		24 53			0 1			2	3	9 11	5 15	1 0
81	Extinct Medical Schools	0 1								3 2			1 1							1	0		2 0
82	Unapproved Medical Schools									25 7	1 0		41 0				2	0			11	59	
83	Schools of Osteopathy					5 0	1 6							3 0							0	9	
84	TOTALS	47	22	52	549	78	44	21	32	327	113	39	434	102	57	100	86	165	29	189	133	164	184
85	Totals—Examined—Passed	46	22	52	492	78	29	21	30	308	109	38	367	98	57	99	86	164	25	172	41	164	184
86	Totals—Examined—Failed	1	0	0	57	0	15	0	1	19	4	1	67	4	0	1	0	1	4	17	92	0	0
87	Percentage Failed	2.1	0.0	0.0	10.4	0.0	34.1	0.0	3.2	5.8	3.5	2.6	15.4	3.9	0.0	1.0	0.0	0.6	13.8	9.0	69.1	0.0	0.0
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

P—Passed; F—Failed.

and the Virgin Islands, the internship is a requirement for licensure. In several of the states the candidate for medical licensure is permitted to take the written examination before completion of the internship and, if successful, the license is issued and dated on completion of the internship requirement. Licenses are also withheld in some states for other technicalities. As a rule the licenses of those examined in December are dated and issued in the following year. The figures in table 1, therefore, include some physicians who were examined in 1948 and previous years. Figures in this table will not correspond with those compilations which deal entirely with physicians examined for licensure in 1949.

Likewise, the figures presented in this table, particularly in the endorsement column, do not necessarily represent individuals, but in some instances include persons who have been licensed in more than one state during 1949. In tables 12 and 14 (see pages 458 and 459) can be noted the number who secured their first license and represent additions to the medical profession in the United States, its territories and outlying possessions.

Of the 12,181 licenses to practice medicine issued in 1949, the greatest number (1,511) were issued in California. New York licensed the next greatest number 1,452. More than 500 physicians were registered in Illinois, Ohio and Pennsylvania. The fewest, 17, were licensed in Wyoming.

There was a decrease of 1,411 in the number of physicians licensed in 1949 as compared with the previous year, although the number of licenses granted exceeded the annual prewar registration by 3,000 or more. The continuing decrease since 1946 when 16,236 physicians

	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
	94	94	0	0.0	7	47
	93	81	2	2.4	9	48
	60	60	0	0.0	8	49
	63	62	1	1.6	12	50
	70	68	2	2.9	12	51
	118	109	9	7.6	21	52
	148	145	3	2.0	23	53
	111	110	1	0.9	25	54
	105	103	2	1.9	24	55
	25	23	2	8.0	11	56
	85	85	0	0.0	13	57
	49	48	1	2.0	7	58
	164	162	2	1.2	16	59
	52	43	9	17.3	16	60
	49	48	1	2.0	6	61
	51	50	1	2.0	7	62
	62	61	1	1.6	5	63
	60	59	1	1.7	6	64
	46	45	1	2.2	14	65
	17	13	4	23.5	5	66
	60	60	0	0.0	8	67
	83	82	1	1.2	7	68
	68	67	1	1.5	17	69
	84	76	8	9.5	25	70
	7	6	1	14.3	5	71
	21	21	0	0.0	8	72
	5	5	0	0.0	5	73
	35	30	5	14.3	16	74
	16	14	2	12.5	10	75
	4	4	0	0.0	4	76
	33	30	3	9.1	14	77
	7	4	3	42.9	2	78
	12	9	3	25.0	8	79
	737	319	418	56.7	27	80
	15	11	4	26.7	7	81
	282	184	98	34.7	12	82
	114	66	48	42.1	10	83
	5,963	....	...	....	..	84
	....	5,219	...	....	..	85
	....	....	744	....	..	86
	....	....	...	12.5	..	87

were licensed indicates that the entry or return to medical practice of physicians who served in the armed forces during the war is nearing completion.

Totals of the physicians licensed for 14 previous years and for 1949 both by examination and reciprocity are included in table 3. The high figures for the years 1936 to 1941 were due to the licensure of foreign-trained physicians. In succeeding years the accelerated program in medical schools which produced 20,662 graduates in the three year period from June 1942 to June 1945 resulted in a noticeable increase the numbers annually licensed.

In the 15 year period 1935 to 1949, 155,935 medical licenses have been issued, 93,386 after written examination and 62,549 by reciprocity and endorsement of credentials.

Candidates Examined by Medical Examining Boards

Compilations referring to those examined in 1949 by individual states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands, indicating the number who passed and failed in each state, the medical school of graduation, the percentage of failures by schools and the number of states in which graduates of a given school were examined, are recorded in table 2. Medical schools in the United States which are no longer operating, faculties of medicine in countries other than the United States and Canada, unapproved medical schools and schools of osteopathy are not listed by name, but the numbers examined in each state in these four categories are included after the figures for existing medical schools in the United States and Canada.

During 1949 there were 5,963 applicants for licensure by written examination, of whom 5,219 passed and 744, or 12.5 per cent, failed. The candidates examined represented 70 approved medical schools in the United States, 9 approved medical schools of Canada, six United States medical schools now extinct, 124 faculties of medicine and two licensing corporations of other countries, six unapproved medical schools in the United States and 10 schools of osteopathy. Osteopaths who were granted the privilege to practice medicine, surgery or both by medical examining boards are included in these statistics. Osteopaths who obtain the legal right to special practice by the osteopathic board are not included in these compilations.

TABLE 3.—*Licenses Issued, 1935-1949*

	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,276	2,773	9,049
1937	6,629	3,205	9,834
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,057	2,762	8,819
1942	6,152	2,469	8,621
1943	6,062	2,340	8,402
1944	7,080	2,596	9,676
1945	5,580	3,622	9,202
1946	6,567	9,669	16,236
1947	6,763	7,701	14,464
1948	5,997	7,595	13,592
1949	5,252	6,929	12,181
Totals	93,386	62,549	155,935

In recent years examinations and reciprocity meetings have been scheduled at frequent periods by many states to facilitate licensure and enable physicians to commence the practice of medicine without delay. Later in this study there is included a tabulation giving the schedules of examinations and meetings for all states.

The 5,963 examinees (table 4) represented 4,675 graduates of approved medical schools in the United States, of whom 3.2 per cent failed; 140 graduates of approved Canadian medical schools, 12.1 per cent of whom failed; 15 who graduated from medical schools in the United States which are now extinct of whom 26.7 per cent failed; 737 graduates of faculties of medicine located in countries other than the United States and Canada, of whom 56.7 per cent failed; 282 graduates of unapproved medical schools in the United States of whom 34.7 per cent failed, and 114 graduates of schools of osteopathy, of whom 42.1 per cent failed.

TABLE 4.—*Source of Candidates Examined for Licensure in the United States, 1949*

Medical Schools	Number of Schools	Number Examined	Number Passed	Number Failed	Percentage Failed
Approved in United States	70	4,675	4,516	159	3.2
Approved in Canada	9	140	123	17	12.1
Extinct	6	15	11	4	26.7
Foreign	126	737	319	418	56.7
Unapproved Schools	6	282	184	98	34.7
Schools of Osteopathy	10	114	66	48	42.1
Totals	227	5,963	5,219	744	12.5

As in table 1, the 5,963 physicians and others examined for medical licensure listed in table 2 do not represent an equal number of individuals, since some candidates took an examination in more than one state and have been counted in each state. However, if a candidate failed more than once in a given state within the year he is counted in that state as only one failure. Figures which show the number of individual licentiates added to the medical profession in 1949 are given in tables 12, 13 and 14.

The greatest number of graduates from any one school examined was 181 from the University of Illinois College of Medicine, 90 of whom were examined in Illinois and 91 by 28 other state medical boards. There were 164 graduates of the University of Tennessee College of Medicine examined in 16 states. Boston University with eight examinees and Albany Medical College with nine examinees represented schools with the fewest number of applicants for medical licensure by written examination method before state boards. The majority of the graduates of these two schools are licensed by endorsement of the certificate of the National Board of Medical Examiners.

Twenty approved schools in the United States and Canada had no failures before medical licensing boards, 32 had less than 5 per cent, 14 had between 5 and 10 per cent, and 13 had 10 per cent or more failures in state examinations. Failures from all existing approved schools in the United States amounted to 3.2 per cent. The percentage of failures recorded by schools in table 6, which includes those who were examined by the National Board of Medical Examiners in its final examination as well as those passing state tests, presents a more accurate analysis of the quality of the graduates of these schools on the basis of their proficiency in examination tests.

TABLE 5.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1949*

	Examined	Passed	Failed
California	18	17	1
Colorado	1	1	0
Connecticut	1	1	0
Delaware	2	2	0
District of Columbia	3	3	0
Florida	5	4	1
Illinois	15	12	3
Indiana	2	2	0
Louisiana	4	3	1
Maine	9	9	0
Maryland	2	2	0
Massachusetts	6	3	3
Minnesota	8	8	0
Mississippi	1	1	0
Missouri	1	1	0
New Hampshire	3	2	1
New Mexico	1	1	0
New York	19	14	5
North Carolina	2	2	0
North Dakota	9	9	0
Ohio	5	5	0
Pennsylvania	12	12	0
Utah	1	1	0
Vermont	2	1	1
Virginia	1	0	1
Washington	2	2	0
West Virginia	2	2	0
Wisconsin	2	2	0
Puerto Rico	1	1	0
Totals	140	123	17

There were 140 graduates of nine approved medical schools in Canada tested for medical licensure in 1949 in 27 states, the District of Columbia and Puerto Rico 123 passed and 17, 12.1 per cent, failed.

Figures for Canadian graduates are given for each licensing board by schools in table 2 and by totals in table 5. The majority of Canadians appeared before the boards in California, Illinois, New York and Pennsylvania. Three Canadian schools had no failures before United States licensing boards, while the other schools had more than 9 per cent failures.

Graduate of medical schools of other countries were examined by 27 boards. There were 737 such graduates with 418 (56.7 per cent) failures.

Graduates of the group of schools no longer in operation were examined in seven states, of whom 11 passed and 4 (26.7 per cent) failed.

There were 282 graduates of unapproved medical schools examined in 12 states, of whom 184 passed and 98, 34.7 per cent, failed.

One hundred and fourteen graduates of schools of osteopathy were examined by 10 medical examining boards with 42.1 per cent failures.

Consolidated Examinations

A more accurate picture of the performance of graduates in licensure examinations than that revealed in the tabulations thus far presented is given by consolidating the results for the graduates of each school on state medical board examinations and on part III of the examination of the National Board of Medical Examiners. The consolidated figures for individual schools are given in table 6. In this connection it should be noted that most of the failures in the National Board examinations occur in parts I and II as shown in tables 40 and 41. Only those candidates who have already passed parts I and II are eligible to take part III. In 1949 there were 4,675 graduates of approved medical schools in the United States examined by medical licensing boards, of whom 3.2 per cent failed. In the same period 1,647 graduates of these institutions appeared for part III of the examinations of the National Board, of whom 0.7 per cent failed. In the consolidated figures for 6,322 graduates, the percentage of failures of graduates of approved medical schools in the United States was reduced from 3.2 per cent to 2.7 per cent. No graduate of any approved school failed in more than one state in 1949. There were 10 graduates of foreign medical schools and one osteopath who failed in two states. Of the failures among approved medical schools, 109 were graduates within the last five years and 67 were graduates of earlier years.

Of the Canadian graduates, 12.1 per cent failed state board tests and 10.2 per cent failed the combined tests. Only 11 graduates of foreign medical faculties were admitted to the National Board's final examination, while 737 were examined by state licensing boards. There is no comparison to be made of this group. There were none in the extinct medical school classification examined by the National Board. The National Board does not admit to its examinations the graduates of unapproved medical schools or schools of osteopathy.

The total of all examined before medical licensing boards as shown in table 6 was 5,963, of whom 5,219 passed and 744, 12.5 per cent failed. For both groups—state boards and the National Board—7,648 were examined, 6,893 passed and 755, 9.9 per cent failed. The total percentage of failures was reduced 2.6 per cent.

Failures in Medical Licensure Examinations

Failures before medical licensing boards by licentiates of 1949 are recorded in table 7. In presenting these statistics the United States is divided into two groups—the 31 states and the District of Columbia in which approved four year medical schools are located and the states, territories and possessions which have no four year medical school within their boundaries. The figures include the number who failed state board examinations and were graduates of a medical school located in the state in which they were examined and also the number of graduates licensed in a given state who obtained their professional training in schools in other states.

TABLE 6.—*Consolidated Examinations, State Medical Examining Boards and the National Board of Medical Examiners, 1949*

School	Results by Medical Examining Board Tests		Part III Examination of National Board of Medical Examiners		Total Examined	Totals		Percentage Failed
	P	F	P	F		P	F	
Medical College of Alabama	31	0	0	0	31	31	0	0.0
University of Arkansas	66	1	0	0	67	66	1	1.5
Coll. of Med. Evan. (Calif.)	103	7	29	1	140	132	8	5.7
Stanford University	56	2	4	0	62	60	2	3.2
University of California	70	1	2	0	73	72	1	1.4
Univ. of Southern California	56	0	3	0	59	56	0	0.0
University of Colorado	64	1	4	0	69	68	1	1.4
Yale University (Connecticut)	12	0	48	0	60	60	0	0.0
George Washington University (D. C.)	30	1	75	2	108	105	3	2.8
Georgetown University	25	6	84	0	115	109	6	5.2
Howard University	56	4	5	0	65	61	4	6.2
Emory University (Georgia)	62	0	1	0	63	63	0	0.0
Medical College of Georgia	74	7	2	0	83	76	7	8.4
Stritch School of Medicine	69	4	11	0	84	80	4	4.8
Northwestern University	142	4	25	0	171	167	4	2.3
University of Chicago School of Medicine	65	1	10	0	76	75	1	1.3
University of Illinois	179	2	16	0	197	195	2	1.0
Indiana Univ. School of Med.	98	2	3	0	103	101	2	1.9
State University of Iowa	51	0	25	0	76	76	0	0.0
University of Kansas	103	2	2	0	107	105	2	1.9
University of Louisville (Ky.)	103	2	13	0	118	116	2	1.7
Louisiana State University	61	1	0	0	62	61	1	1.6
Tulane Univ. of Louisiana	119	0	4	0	123	123	0	0.0
Johns Hopkins University	83	2	14	0	99	97	2	2.0
University of Maryland	70	0	9	1	80	79	1	1.2
Boston University	8	0	59	0	67	67	0	0.0
Harvard Medical School	33	0	106	0	139	139	0	0.0
Tufts College Medical School	26	2	85	1	114	111	3	2.6
University of Michigan	109	3	42	0	154	151	3	1.9
Wayne University	53	0	9	0	62	62	0	0.0
University of Minnesota	116	4	15	0	135	131	4	3.0
St. Louis University	117	6	14	0	137	131	6	4.4
Washington University	91	0	6	0	97	97	0	0.0
Creighton University	40	4	8	0	52	48	4	7.7
University of Nebraska	54	4	11	0	69	65	4	5.8
Albany Medical College	9	0	39	0	48	48	0	0.0
Columbia University	35	3	91	0	129	126	3	2.3
Cornell University	38	2	63	1	104	101	3	2.9
Long Island Coll. of Medicine	22	8	87	0	117	109	8	6.8
New York Medical College	14	4	112	1	131	126	5	3.8
New York University	25	6	109	0	140	134	6	4.3
Syracuse University	21	4	23	0	48	44	4	8.3
University of Buffalo	10	2	67	2	81	77	4	4.9
University of Rochester	31	3	47	0	81	78	3	3.7
Duke University	24	0	62	0	86	86	0	0.0
Bowman-Gray School of Med.	38	1	2	0	41	40	1	2.4
Ohio State University	60	0	1	0	61	61	0	0.0
University of Cincinnati	94	0	0	0	94	94	0	0.0
Western Reserve University	81	2	6	0	89	87	2	2.2
University of Oklahoma	62	1	2	0	65	64	1	1.5
University of Oregon	68	2	10	0	80	78	2	2.5
Hahnemann Med. Coll., Phila.	109	9	22	1	141	131	10	7.1
Jefferson Medical College	145	3	11	0	159	156	3	1.9
Temple University	110	1	16	0	127	126	1	0.8
University of Pennsylvania	103	2	32	0	137	135	2	1.5
University of Pittsburgh	85	0	3	0	88	88	0	0.0
Woman's Medical College	23	2	11	0	36	34	2	5.6
Med. Coll. of South Carolina	48	1	2	0	51	50	1	2.0
Meharry Medical College	43	9	5	0	57	48	9	15.8
University of Tennessee	162	2	2	0	166	164	2	1.2
Vanderbilt University	48	1	6	0	55	54	1	1.8
Baylor University	59	1	3	0	63	62	1	1.6
Southwestern Medical College	50	1	0	0	51	50	1	2.0
University of Texas	61	1	2	0	64	63	1	1.6
University of Utah	45	1	7	0	53	52	1	1.9
University of Vermont	13	4	26	0	43	39	4	9.3
Medical College of Virginia	82	1	2	0	85	84	1	1.2
University of Virginia	60	0	1	0	61	61	0	0.0
Marquette University	76	8	18	1	103	94	9	8.7
University of Wisconsin	67	1	2	0	70	69	1	1.4
Subtotals: U. S. Schools	**4,516**	**159**	**1,636**	**11**	**6,322**	**6,152**	**170**	**2.7**
University of Alberta	6	1	0	0	7	6	1	14.3
University of Manitoba	21	0	1	0	22	22	0	0.0
Dalhousie University	5	0	0	0	5	5	0	0.0
University of Toronto	30	5	4	0	39	34	5	12.8
Queen's University	14	2	3	0	19	17	2	10.5
Univ. of Western Ontario	4	0	1	0	5	5	0	0.0
McGill University	30	3	18	0	51	48	3	5.9
University of Montreal	4	3	0	0	7	4	3	42.9
Laval University	9	3	0	0	12	9	3	25.0
Subtotals: Canadian Schools	**123**	**17**	**27**	**0**	**167**	**150**	**17**	**10.2**
Foreign Medical Faculties	**319**	**418**	**11**	**0**	**748**	**330**	**418**	**55.9**
Extinct Medical Schools	**11**	**4**	**0**	**0**	**15**	**11**	**4**	**26.7**
Unapproved Schools	**184**	**98**	**0**	**0**	**282**	**184**	**98**	**34.7**
Schools of Osteopathy	**66**	**48**	**0**	**0**	**114**	**66**	**48**	**42.1**
Totals	**5,219**	**744***	**1,674**	**11***	**7,648**	**6,893**	**755**	**9.9**

* Represents individuals failed.

In general, state licensing boards require the applicant to receive a general average of 75 per cent and 60 per cent in any one subject. In case of failure in not more than two subjects, the applicant is permitted a second examination in those subjects within 12 months. A few states consider such persons as conditioned in the subjects in which they fail. Conditioned candidates are not counted as failures in this study.

TABLE 7.—*Licensure Failures by Graduates of Existing Approved Schools Located in the States Where Examined and Elsewhere, 1949*

States with Four Year Medical Schools	Total No. Examined	No. Failures of Schools in State	No. Schools in State Represented at Examinations	Per Cent Failed	No. Failures of Schools Out of State	No. Schools Out of State Represented at Examinations	Per Cent Failed	Per Cent Failed in All U. S. Schools
Alabama	46	0	1	0.0	0	13	0.0	0.0
Arkansas	52	0	1	0.0	0	1	0.0	0.0
California	484	10	4	2.1	16	53	3.3	5.4
Colorado	66	0	1	0.0	0	14	0.0	0.0
Connecticut	24	0	1	0.0	2	16	8.3	8.3
Dist. of Columbia	25	0	3	0.0	0	8	0.0	0.0
Georgia	112	4	2	3.6	0	8	0.0	0.0
Illinois	314	3	4	0.9	10	49	3.2	4.1
Indiana	99	2	1	2.0	2	14	2.0	4.0
Iowa	57	0	1	0.0	0	8	0.0	0.0
Kansas	99	0	1	0.0	0	13	0.0	0.0
Kentucky	84	0	1	0.0	0	5	0.0	0.0
Louisiana	165	0	2	0.0	1	18	0.6	0.6
Maryland	168	0	2	0.0	6	22	3.6	3.6
Massachusetts	34	0	3	0.0	9	20	26.5	26.5
Michigan	164	0	2	0.0	0	23	0.0	0.0
Minnesota	181	0	1	0.0	0	39	0.0	0.0
Missouri	197	0	2	0.0	0	16	0.0	0.0
Nebraska	54	3	2	5.6	0	0	0.0	5.6
New York	217	27	9	12.4	45	40	20.7	33.1
North Carolina	88	0	2	0.0	0	25	0.0	0.0
Ohio	226	0	3	0.0	0	22	0.0	0.0
Oklahoma	47	0	1	0.0	0	0	0.0	0.0
Oregon	51	1	1	2.0	3	14	5.9	7.8
Pennsylvania	389	2	6	5.2	0	36	0.0	5.2
South Carolina	44	1	1	2.3	0	3	0.0	2.3
Tennessee	175	0	3	0.0	0	1	0.0	0.0
Texas	170	2	3	1.2	2	12	1.2	2.4
Utah	30	0	1	0.0	0	10	0.0	0.0
Vermont	15	3	1	20.0	1	3	6.7	26.7
Virginia	108	1	2	0.9	2	6	1.9	2.8
Wisconsin	108	0	2	0.0	0	25	0.0	0.0
Subtotals	4,093	59	70	1.5	90	537	2.4	3.9
States Without Four Year Medical Schools								
Arizona	22				0	16	0.0	
Delaware	21				0	14	0.0	
Florida	277				7	59	2.5	
Idaho	39				1	18	2.6	
Maine	24				1	14	4.2	
Mississippi	36				2	14	5.6	
Montana	8				0	10	0.0	
Nevada	4				0	4	0.0	
New Hampshire	6				1	5	16.7	
New Jersey	67				3	24	4.5	
New Mexico	4				1	3	25.0	
North Dakota	23				0	11	0.0	
Rhode Island	11				0	10	0.0	
South Dakota	10				0	6	0.0	
Washington	65				0	30	0.0	
West Virginia	59				0	32	0.0	
Wyoming	1				0	1	0.0	
Alaska, Hawaii, Puerto Rico and Virgin Islands	45				2	25	4.4	
Subtotals	722				18	296	2.5	

The physicians who failed examinations in the state in which they obtained their professional training numbered 59. This occurred in 12 states. New York reported 27 and California 10. Twelve states reported 99 failures among students who graduated from approved medical schools located in states other than the one in which they were licensed. Again, New York had the greatest number, 45. Seventeen states had no failures in either group, eight states had failures in both groups.

In the 17 states and the territories and possessions which do not have medical schools, eight reported 18 failures.

Of the 4,815 graduates of approved medical schools in the United States and Canada examined for licensure in 1949, 176 failed.

The data pertaining to licensure failures are further subdivided in table 8 by the number of candidates who were licensed after previously failing a licensing examination. The figures are presented for four categories —approved medical schools in the United States and Canada, foreign faculties of medicine, unapproved medical schools and schools of osteopathy. These groups are classified according to the number licensed after failing a state board examination once and after two or more failures. The table further indicates whether the single and multiple failures have been in the state where licensed or elsewhere. The total number of candidates licensed after examination or by endorsement of credentials is shown and also the total number of failures in all groups.

Of the 12,181 licenses to practice medicine issued in 1949, 497 were granted to applicants who had previously been unsuccessful before a licensing board. All physicians licensed in six states had no failures in a state medical examination.

From the approved schools, 227 graduates had previously failed a state board examination. Eighty-seven had one failure in the state in which they were licensed while 91 were licensed after one failure elsewhere. Forty-nine received licenses after more than one failure.

Of the group of foreign medical graduates, 196 were licensed after previous failure. One hundred and six had more than one previous failure.

Fifty-two graduates of unapproved medical schools and 32 graduates of schools of osteopathy failed a state board test before licensure.

Twenty-two physicians had more than 10 failures before securing licensure. One of these was a graduate of an approved medical school in the United States with 11 failures; eight were graduates of unapproved medical schools who had had previous failures ranging from 10 to 18, and 13 were graduates of foreign faculties of medicine who had more than 10 failures. One foreign graduate had 20 failures before finally securing licensure and another 26 failures. A few of the states have no restrictions on the number of examinations which may be taken prior to licensure but most states have a set limit of three examinations.

Registration by Reciprocity and Endorsement

The reciprocity and endorsement policies in medical licensure in the United States, Alaska, Hawaii and Puerto Rico are summarized in table 9. Florida is the only state which requires all applicants for licensure to pass a written examination. Hawaii does not have reciprocal relations with any state but will endorse physicians certified by the National Board of Medical Examiners. Those desiring licensure by reciprocity or endorsement in 16 states, the District of Columbia and Alaska are required to obtain a certificate from the state board of examiners in the basic sciences before being eligible for medical licensure. In the section in these statistics pertaining to basic science boards there is included a table indicating the reciprocity, endorsement, exemption or waiver policies of the basic science boards.

Thirty states, Alaska and Puerto Rico have definite reciprocal agreements with specific states. Indiana

recently cancelled reciprocal agreements and will in the future consider all persons applying for licensure without examination on an individual basis. Fifteen of these states and Puerto Rico, and 19 others are given discretionary powers to endorse applicants from non-reciprocating states who present credentials which correspond with those required by their respective boards in the year issued.

This chart will be available in reprint form. It is helpful to physicians who are considering a change in location. The facts recorded in this table are intended to present merely general statements of licensure policies. The information here given should be supplemented by direct communication with the licensing board. A list of the executive officers in charge of medical licensure appears elsewhere in this study.

TABLE 8.—*Failures Before Medical Licensing Boards by Licentiates, 1949*

	Licenses Issued by Examination, Reciprocity or Endorsement	Approved Schools					Foreign Schools					Unapproved Medical Schools					Schools of Osteopathy					Total Failures by Licentiates, 1949
		Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	
Alabama	104	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Arizona	99	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Arkansas	91	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
California	1,511	10	16	1	6	..	3	1	2	1	..	..	..	..	..	..	..	..	..	..	..	40
Colorado	161	..	3	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	6
Connecticut	229	2	2	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	7
Delaware	31	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
District of Columbia	227	1	..	..	..	..	..	2	..	3	..	..	..	..	..	..	..	..	..	..	..	6
Florida	325	8	4	..	1	..	1	1	..	..	1	3	5	..	2	2	..	..	..	..	..	28
Georgia	179	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Idaho	52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Illinois	590	5	3	..	1	..	10	1	4	..	..	1	..	..	..	..	..	..	..	..	..	25
Indiana	237	.	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	5
Iowa	196	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Kansas	185	..	1	..	..	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..	..	1
Kentucky	158	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Louisiana	250	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Maine	69	1	3	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	7
Maryland	301	1	2	..	1	..	1	1	..	1	..	.	..	..	..	..	..	..	..	..	..	7
Massachusetts	389	1	4	1	..	..	1	..	..	..	..	4	..	3	..	1	..	..	..	..	..	17
Michigan	411	..	3	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
Minnesota	312	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Mississippi	93	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Missouri	316	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Montana	44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Nebraska	99	5	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	11
Nevada	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
New Hampshire	73	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2
New Jersey	346	2	3	1	2	..	..	3	1	12	3	..	..	..	..	..	1	..	1	..	..	31
New Mexico	48	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
New York	1,452	38	4	17	..	..	47	1	53	2	7	11	4	3	..	5	3	..	3	..	1	199
North Carolina	216	..	1	..	3	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	6
North Dakota	48	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Ohio	568	..	3	..	..	..	..	4	..	5	1	..	..	.	..	..	6	..	..	..	..	19
Oklahoma	131	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Oregon	150	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Pennsylvania	644	6	5	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
Rhode Island	40	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	3
South Carolina	83	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
South Dakota	39	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Tennessee	218	..	2	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4
Texas	437	2	2	..	1	..	..	1	..	..	1	..	..	..	..	..	3	1	..	..	..	11
Utah	69	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Vermont	48	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Virginia	233	1	..	..	1	..•	..	..	..	1	..	..	1	..	1	1	..	..	..	..	..	6
Washington	224	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2
West Virginia	114	..	°	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Wisconsin	195	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Wyoming	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Alaska, Hawaii, Puerto Rico and Virgin Islands	97	1	..	..	..	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	4
Totals	12,181	87	91	22	26	1	65	25	62	29	15	19	12	8	4	9	14	1	5	1	1	497

There is also included in this table a column indicating the recognition accorded the certificate of the National Board of Medical Examiners. All states but Florida, Montana and Wisconsin accept the National Board's certificate.

Specific requirements, such as professional practice, citizenship, oral examination and internship are recorded as is also the fee for a license without written examination. In some states physicians of Canadian birth are exempt from the citizenship requirement. This is indicated by footnote. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Additional requisites or exemptions are included in footnotes.

Table 20 (page 461) contains a schedule indicating when the boards will issue licenses by reciprocity.

The credentials presented by physicians granted licenses to practice medicine without written examination are given in table 10. There were 6,929 so registered on the basis of licenses from other states, the District of Columbia, territories or possessions of the United States, foreign countries, the certificate of the National Board of Medical Examiners, by special exemption and by acceptance of service with an agency of the government of the United States. In recent years the number securing licenses by this method has been increasing although the figures for 1949 showed a decrease in comparison with the preceding year.

New York issued the greatest number of licenses by this method. In this state 1,041 were registered. California licensed 1,027. Figures for other states were fewer than 325. Nine states licensed more than 200.

The largest number of candidates who presented the same type of credential were the 2,536 diplomates and Pennsylvania. No physician holding a Wyoming license applied for registration in another state during 1949 and only two from Nevada and New Mexico.

One hundred and three medical officers of one of the government services received licenses by endorsement of their military credentials in eight states. Eleven

TABLE 9.—*Reciprocity and Endorsement*

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by: Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number
1	Alabama	..	..	+	+	+	..	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	+	..	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	..	+	+	..	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (reg. & homeo. bds.)	..	..	..	..	..	..	+	..	..	+	..	+	..	+	..	+	+	+	+	+	+	..	+	..	..	..	..	+	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies											..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	..	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	10
11	Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois	+	..	+	+	+	..	..	..	..	..	..	..	+	+	+	+	+	+	+	..	+	..	+	+	..	+	+	..	+	..	12
13	Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
14	Iowa	+	..	+	+	+	..	+	+	..	+	..	+	+	..	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	14
15	Kansas	+	+	+[19]	+	..	+	+	+	..	+	..	+	+	+	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	15
16	Kentucky	+	..	+	+	+	..	+	+	..	+	..	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	16
17	Louisiana (reg. & homeo. bds.)	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	17
18	Maine	..	..	+	+	+	..	+	+	..	+	..	+	+	+	+	+	..	+	+	..	+	..	+	+	..	+	+	+	+	+	18
19	Maryland (reg. & homeo. bds.)	+	..	+	+	..	+	..	+	..	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	19
20	Massachusetts	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
21	Michigan	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	21
22	Minnesota	+	+	+	+	+	+	+	..	..	+	..	..	..	+	..	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	22
23	Mississippi	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	23
24	Missouri	+	..	+	+	..	..	..	..	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+	+	..	..	..	24
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska	+	+	+	+	+	+	+	..	+	..	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	26
27	Nevada	+	..	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	..	..	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	29
30	New Mexico	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota	+	..	+	+	+	..	..	..	+	..	..	+	+	+	+	+	..	..	+	..	..	+	..	+	+	..	+	+	+	+	33
34	Ohio	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36
37	Pennsylvania	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	37
38	Rhode Island	..	..	..	..	..	+[14]	..	..	..	..	..	+[14]	..	+[14]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	..	38
39	South Carolina	+	..	..	..	..	..	..	+	..	+	..	..	..	..	+	+	+	+	+	..	+	..	+	+	..	+	..	+	..	+	..	39
40	South Dakota	+	+	+	+	+	..	..	+	..	+	..	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	..	+	+	40
41	Tennessee	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	+	41
42	Texas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42
43	Utah	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	+	..	+	+	..	..	+	..	+	..	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	..	..	+	+	+	45
46	Washington	+	..	..	+	+	..	..	..	..	+	..	..	+	+	..	+	+	..	+	..	+	..	+	+	+	+	+	..	..	..	..	46
47	West Virginia	+	..	+	[38]	[38]	+	+	+	..	+	..	+	+	+	+	+	+	+	+	[38]	+	+	+	+	+	+	+	..	+	+	..	47
48	Wisconsin	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	+	+	..	+	+	..	..	+	..	+	+	+	+	..	..	..	+	+	+	..	50
51	Hawaii	No reciprocal relations											..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Puerto Rico	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	..	..	..	+	..	..	..	..	52

This summary should be supplemented by direct communication with the

Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or endorsement relationships have been established; .. indicates no reciprocal or endorsement relationships have been established. (See column—"At the discretion of the board.")

1. 1st P, first papers required; ⊕, in citizenship column indicates full citizenship required, in other columns it implies a requirement.
2. In most cases there is a small additional recording or registration fee.
3. Year of practice after internship required.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. All applicants must be graduates of a medical school approved by the American Medical Association.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Canadian citizens are required to file first papers.
11. Not applicable to citizens of Canada.
12. Oral examination required when original license is ten or more years old.
13. Applicant must have resided in the state used as basis of application for one year after date on said certificate, or show two years of licensed practice in some other state.
14. Oral examination required.
15. Graduates of foreign medical schools must have fulfilled all requirements of California prior to admittance to examination for any certificate used as basis of application to California.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
18. Foreign graduates only.
19. Regular and Homeopathic boards.

certified by the National Board of Medical Examiners. On the basis of the certificate of the National Board 756 were licensed in New York, 273 in Massachusetts and 215 in California.

More than 300 presented licenses for reciprocal registration in the various states from Illinois, New York physicians were licensed in three states on the basis of a license issued in one of the territories or possessions of the United States, 68 on the basis of Canadian or foreign licenses and 26 by special exemption.

Table 11 records the numbers from individual schools represented by the 6,929 reciprocity licentiates.

Every approved medical school in the United States and Canada had graduates licensed without examination in 1949. More than 200 graduates of four schools secured such licensure. The wide use of licensure by this method can be noted by an examination of this table which reflects the movement of physicians to states other than the one in which they were originally licensed.

One hundred and fifty-two foreign trained physicians obtained licenses by reciprocity or endorsement in 22 states and the territories and outlying possessions and 107 graduates of medical schools no longer in operation were registered by 31 states. Seven graduates of unapproved medical schools secured licenses in four states, while 32 graduates of schools of osteopathy were registered in 11 states to practice medicine or surgery or both. There are 731 persons represented in these four groups.

Policies of Medical Licensing Boards

Marginal Number	Reciprocates with, or Endorses Certificates Granted by: New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	Requirements: Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous	Marginal Number
1	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	..	⊕	1[4]	⊕[11]	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[6]	⊕	3[4,7]	⊕	100	42	2
3	+	+	+	+	+	+	+	..	+	+	+	..	..	+	+	..	+	+	+	+	..	..	+[9]	..	..	1[4]	⊕	50[22]	42	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	41	1[13]	⊕[21]	100	12,15	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[42]	+[9]	⊕	..	1[4]	1st P	50	42	5
6	..	..	..	+	..	..	+	+	..	..	+	..	..	+	..	..	..	..	..	..	..	+	+[27]	⊕[19]	..	3[16]	1st P	50	..	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[5]	..	⊕	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[27]	⊕	⊕	1[3]	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	⊕	..	..	⊕	..	..	9
10	..	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	100	..	11
12	..	+	+	+	+	+	+	..	..	..	+	+	+	+	+	+	+	+	+	+	..	..	+[17]	..	⊕	1	1st P	25	17,42	12
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	1[4]	..	50	..	13
14	..	+	+	+	+	..	+	..	..	+	+	..	+	..	+	+	+	+	+	..	..	..	+	⊕	⊕	1[4]	⊕[11]	50	..	14
15	..	+	+	+	+	..	+	..	+	+	+	+	+	+	..	+	+	+	+	..	..	..	+	..	..	1[4,7]	⊕	31	42	15
16	..	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	1[4]	⊕	50	42	16
17	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	..	+[25]	..	[33]	1[4]	1st P[40,10]	50[22]	42	17
18	..	..	+	+	+	+	+	..	+	..	+	+	+	+	..	+	+	+	..	..	..	..	+[14]	..	..	1[4]	⊕[11]	50	..	18
19	+	+	..	+	+	+	+	..	+	..	+	+	..	+	+	..	+	+	..	+	..	+	+	..	..	1[4]	1st P	50	42	19
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	0	1st P	50[28]	..	20
21	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+[35]	⊕[37]	⊕	1[4]	..	55	34	21
22	+	+	..	+	+	+	+	..	..	+	+	..	+	+	+	+	+	+	+	+	..	+	+	⊕	..	0	⊕[11]	75	17,42	22
23	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	..	⊕[11]	50	42,11	23
24	..	..	+	+	..	..	..	..	..	..	+	..	+	..	..	+	+	+	..	+	..	+	+[39]	..	⊕[33]	1[4]	⊕	50	..	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	⊕	1[4]	⊕	75	42	25
26	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+[36]	⊕	..	1[4]	⊕	50	..	26
27	+	..	..	+	+	+	+	..	..	+	+	..	+	+	..	+	+	+	..	+	..	..	+	..	⊕	1[4]	1st P	200	14,42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	⊕[11]	20	..	28
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	⊕	0	⊕	100	..	29
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	⊕	⊕	1[4]	1st P	50	..	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	2	1st P	25	..	31
32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	0	..	50	42,6	32
33	..	+	..	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	1	⊕	50[22]	14,42	33
34	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	..	1[4]	⊕	50	..	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[32]	⊕	1[4]	⊕	100	42,11,6	35
36	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+[29,23]	+[9,27]	⊕	⊕	1[4]	⊕	100	..	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	2[24]	1st P	50	42	37
38	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	+[14]	..	..	..	..	..	+[14]	+[14]	⊕	⊕	0	1st P	20	..	38
39	..	+	..	+	+	+	+	..	..	..	+	+	..	..	+	+	+	+	+	..	..	..	+[14]	..	..	1[4]	⊕	50	42	39
40	..	+	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	..	..	..	+	⊕	⊕	1	1st P	50	42	40
41	+	+	..	+	+	..	+	..	+	+	..	+	+	..	+	+	+	+	+	..	..	..	+[30]	⊕	..	0	⊕	50	42	41
42	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	..	0	⊕	25	..	42
43	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	21	..	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[38]	..	⊕	1[3]	⊕	50	..	44
45	..	+	..	+	..	+	..	+	+	+	+	..	+	..	+	+	⊕	..	..	..	..	+	+	..	⊕[18]	2[26]	1st P[11]	50	..	45
46	..	..	..	+	+	+	..	..	+	+	..	+	+	+	..	..	+	..	+	..	..	..	+[8]	⊕[8]	⊕	0	..	25	..	46
47	..	+	+	+	+	+	..	+	+	+	+	+	+	+	..	..	+	+	+	..	..	..	+	..	⊕	0	⊕	100	..	47
48	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	..	+	..	+	..	+	+[14]	⊕	⊕	1[29]	1st P	50[22]	42	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[24]	+[14]	..	⊕	0	⊕	50	..	49
50	..	+	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	0	⊕	100	6	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	⊕	..	⊕	25	42,6	51
52	+	..	+	..	..	..	+	..	+	..	..	..	..	..	..	..	..	+	..	..	..	+[3]	+	..	⊕	1[3]	⊕	30	..	52

[1] Secretary of the licensing board of the state in which the physician is interested.

20. Reciprocity is extended to all states which accept Oregon licentiates on reciprocity basis.
21. Not required if country in which applicant is licensed will admit to practice citizens of the United States licensed to practice in some state or on proof of requirements similar to those required by California of graduates of foreign medical schools.
22. Fee same as applicant's state charges if more than $50.
23. Oral examination required if applicant's state requires it.
24. If the applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.
25. License in state with which Louisiana reciprocates required.
26. Internship accepted—considered equivalent to two years' practice.
27. Fee $25.
28. Fee for license on basis of National Board certificate, $25.
29. A two year internship is accepted.
30. Diplomates of National Board not required to have been in practice for three years.
31. Same as required of candidates of state applying for licensure.
32. Not required for licensure by reciprocity.
33. Reciprocity applicants only.
34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.
35. May be licensed after a special (written) supplemental examination.
36. Fee $50.
37. For matriculants after Oct. 15, 1937.
38. Licentiates of California, Colorado and Massachusetts accepted on reciprocal basis at discretion of board.
39. Fee, $15.
40. Permanent license withheld until completion of citizenship.
41. Graduates of foreign medical schools effective Sept. 15, 1935. Canadian schools exempted effective Sept. 19, 1939.
42. Graduates of foreign medical schools are not accepted.

Licentiates Representing Additions To The Medical Profession

Figures for the number of physicians who received their first license to practice medicine and surgery in 1949 and who thus represent additions to the medical profession in the United States and its territories and

TABLE 10.—*Candidates Licensed by Reciprocity and Endorsement of Credentials, 1949*

Source of Former License or Credentials

State Issuing License by Reciprocity or Endorsement	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Govt. Services	National Board of Medical Examiners	U.S. Terr. and Possessions	Canadian, Foreign	Special Exemption
Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
Alabama	88	..	..	3	..	..	..	..	..	..	7	..	3	..	3	1	2	17	..	2	..	1	2	1	6	..	..	..	..	1	..	2	4	..	2	4	..	2	..	16	2	..	..	2	..	..	..	8	..	..	..
Arizona	77	..	..	2	3	1	1	..	1	..	..	1	6	2	2	1	..	..	..	3	..	8	4	..	..	..	5	..	..	1	..	4	1	..	4	1	..	2	..	..	2	..	..	1	..	..	..	2	..	..	..	..	3	..	1	..
Arkansas	39	..	..	..	1	..	..	..	..	..	..	..	3	..	1	2	..	5	..	1	..	3	1	..	1	..	1	..	..	..	1	..	11	..	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
California	1,027	..	2	6	..	10	2	..	..	3	7	1	138	29	20	20	11	16	..	37	2	46	60	5	34	2	34	2	..	11	..	69	6	3	47	10	8	54	..	1	2	13	11	4	1	5	16	2	50	..	37	215	5	..	..
Colorado	83	..	..	..	1	..	..	..	1	..	1	..	10	2	2	1	1	..	..	..	..	4	11	..	3	1	13	..	..	2	..	2	..	..	4	1	..	6	1	..	..	5	..	..	2	1	..	..	2	..	..	128	..	..	..
Connecticut	197	..	..	..	2	..	..	..	..	..	..	..	4	1	1	..	1	2	1	2	1	2	2	..	1	1	1	..	2	2	..	21	..	..	4	1	..	6	1	..	..	5	..	..	2	1	..	..	..	..	..	..	..	..	..
Delaware	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	3	..	3	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dist. of Columbia	197	..	..	4	3	..	..	..	..	..	..	..	2	3	..	1	1	1	2	19	..	..	..	1	3	..	..	..	..	1	..	7	5	..	3	..	..	15	..	1	..	5	3	..	..	11	..	..	..	..	..	102	3	1	..
Florida	0	..	..	..	..	..	..	..	..	..	..	..	2	3	..	1	..	7	2	5	..	3	3	2	1	..	..	..	..	1	..	..	1	..	1	1	..	5	..	2	..	9	2	..	..	5	..	..	..	..	..	10	..	..	..
Georgia	70	1	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	..	..	..
Idaho	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Illinois	220	..	1	3	7	4	..	..	..	..	..	..	..	9	7	2	3	..	..	..	..	12	..	..	26	..	4	..	..	..	..	..	1	1	13	4	1	13	..	..	..	4	4	1	..	1	..	2	16	..	1	77	..	..	..
Indiana	139	..	..	2	2	1	..	..	..	..	..	..	24	..	3	4	9	3	..	2	..	9	..	..	7	..	5	..	..	..	..	7	..	..	20	4	..	7	..	..	..	3	5	..	..	1	1	..	6	..	..	23	..	..	1
Iowa	132	..	..	..	3	2	1	..	..	..	..	..	16	..	..	6	3	1	1	..	1	3	..	..	7	..	5	..	..	..	1	..	..	1	..	8	..	..	2	..	..	..	3	..	..	..	..	..	..	3	..	..	20	..	..	..
Kansas	86	..	..	4	2	..	1	..	..	..	2	..	7	4	1	..	1	3	..	..	..	2	..	2	5	..	5	..	..	1	..	..	1	..	5	2	..	5	..	..	1	4	5	..	..	..	..	..	3	..	..	13	..	..	..
Kentucky	72	1	..	1	..	1	..	..	..	..	1	..	6	7	2	..	..	4	1	2	..	1	..	..	1	..	..	..	..	..	1	..	..	1	..	7	..	..	5	..	..	..	12	11	..	..	4	1	1	1	..	..	..	..	..
Louisiana	86	3	..	4	4	1	..	..	..	..	3	..	3	4	..	..	2	..	..	2	..	2	1	5	4	..	..	..	..	1	..	11	1	..	..	3	..	2	..	..	..	12	11	..	..	4	1	1	1	..	..	..	..	..
Maine	44	..	..	..	..	..	1	..	..	..	..	..	4	..	..	3	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	14	2	..	3	..	..	14	..	..	..	..	1	..	2	..	..	6	1	..	..	..	27	..	..	..
Maryland	123	..	..	2	3	..	..	1	11	..	..	..	2	..	..	..	2	4	..	..	1	3	..	..	2	..	..	..	1	4	..	2	2	..	6	..	..	10	..	2	..	..	..	..	6	..	..	..	..	..	45	..	..	..
Massachusetts	319	1	..	1	..	..	3	..	..	..	..	..	..	..	..	..	1	2	..	3	..	..	1	..	1	..	..	..	..	4	..	2	2	..	6	3	..	2	6	1	1	7	..	..	34	..	..	..
Michigan	215	..	..	..	9	..	..	..	..	..	1	..	14	13	7	4	2	4	1	11	..	..	15	1	9	..	3	..	..	2	..	6	4	..	28	3	1	16	..	..	1	6	3	..	2	6	1	1	7	..	..	34	..	..	..
Minnesota	128	2	1	..	3	5	..	..	..	..	..	..	..	1	2	..	2	1	..	..	..	8	..	..	7	..	6	..	..	1	..	1	1	..	4	..	..	4	..	1	..	2	..	..	..	4	1	..	6	..	..	64	..	..	..
Mississippi	61	1	..	2	2	..	..	..	..	..	2	..	3	..	..	..	1	13	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	..	3	1	..	4	..	1	..	13	1	1	..	..	..	..	..	..	..	4	..	9	..
Missouri	122	..	..	2	2	..	..	..	1	..	..	..	10	1	4	22	4	1	..	..	..	5	1	1	..	1	7	..	..	..	1	1	1	..	1	3	..	2	..	..	..	8	2	..	..	3	1	..	7	..	..	30	..	..	..
Montana	36	..	..	1	3	1	..	..	..	..	..	..	5	1	..	..	..	..	..	1	..	5	3	..	2	..	1	..	..	1	..	2	..	1	3	..	..	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Nebraska	47	..	..	..	4	2	..	..	..	..	..	..	3	..	10	4	..	..	..	1	..	..	3	..	3	..	..	..	..	..	..	3	..	..	5	..	..	2	..	..	1	..	..	..	..	..	..	..	1	..	..	5	..	..	..
Nevada	26	1	..	..	7	..	..	..	..	..	..	..	3	..	1	1	1	..	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	34	..	3	..
New Hampshire	66	..	..	..	..	..	1	..	..	..	..	..	2	..	..	..	2	1	..	..	1	2	4	2	..	..	1	..	..	..	..	3	1	..	1	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	102	..	..	..
New Jersey	270	..	..	..	1	..	1	2	..	..	..	..	5	4	..	3	3	3	3	16	1	1	2	..	3	..	..	..	..	..	..	60	2	..	7	1	..	36	..	..	..	5	1	..	..	1	..	..	..	..	..	5	..	1	..
New Mexico	44	..	..	..	..	1	..	..	..	..	..	..	3	1	1	1	..	4	..	..	1	1	2	1	1	..	1	..	..	..	..	3	1	..	2	..	1	2	..	..	..	8	2	..	..	3	1	..	7	..	..	30	..	..	..
New York	1,041	2	..	1	12	5	..	..	3	..	2	..	2	5	7	..	3	15	..	34	7	17	5	..	..	..	1	..	..	6	..	..	4	..	..	37	..	..	1	8	..	5	9	2	..	12	..	..	756	3	48	22
North Carolina	128	..	..	1	6	1	..	..	..	..	5	..	1	2	..	1	..	1	1	8	1	4	..	1	2	..	..	..	..	2	..	5	..	..	2	..	..	6	..	9	..	6	3	..	..	14	2	2	..	..	..	42	..	..	..
North Dakota	24	..	..	1	1	..	..	..	..	..	..	..	3	..	..	1	..	..	..	1	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	4	..	2	1
Ohio	278	..	..	3	4	..	2	..	2	..	1	..	15	11	10	2	10	1	3	11	1	19	5	..	25	..	3	..	..	4	..	22	3	..	..	2	..	22	..	1	1	9	1	..	2	7	..	6	1	..	..	69	..	..	..
Oklahoma	61	..	..	1	4	1	..	..	1	..	..	..	2	..	2	7	1	5	..	1	..	2	1	..	3	..	2	..	..	..	1	..	..	1	3	..	..	2	..	..	..	5	4	..	..	..	2	..	7	..	..	27	..	..	..
Oregon	103	..	..	1	6	3	..	..	..	..	..	..	7	2	6	..	..	..	..	3	..	5	16	..	10	..	3	..	..	1	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	..	..	..
Pennsylvania	247	..	..	..	6	1	1	2	6	..	4	..	5	1	1	1	5	..	3	10	2	4	3	..	7	..	3	..	1	16	..	19	3	1	15	1	..	..	2	..	1	4	1	..	1	5	..	1	1	..	1	107	..	..	2
Rhode Island	25	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	22	..	..	..
South Carolina	40	..	..	1	..	..	..	..	1	..	6	..	..	..	..	1	1	..	..	2	..	..	..	..	1	..	..	..	..	..	..	2	2	..	..	..	..	2	..	..	..	3	2	..	..	4	..	1	..	..	..	11	..	..	..
South Dakota	29	..	..	..	1	1	..	..	..	..	..	..	..	1	3	1	3	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	6	..	..	..
Tennessee	78	..	..	1	2	..	..	1	1	..	12	..	4	1	..	1	4	2	..	1	..	..	2	8	3	..	..	..	1	1	..	10	2	..	14	14	..	12	..	2	..	15	..	1	..	3	..	1	5	..	6	30	..	..	..
Texas	292	3	..	3	14	..	1	1	..	..	4	..	28	18	9	4	8	36	..	9	1	4	1	3	21	..	7	..	3	..	1	2	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	1	1	12	..	..	..
Utah	38	..	..	..	5	..	..	..	..	1	1	1	1	1	..	1	..	..	1	2	..	1	..	..	4	1	2	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	23	..	1	..
Vermont	34	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	31	..	..	..
Virginia	123	1	..	..	1	..	..	..	6	..	2	..	2	..	..	1	3	..	1	8	1	2	1	3	6	..	1	..	..	3	..	6	8	..	7	4	..	4	..	2	1	10	..	..	..	..	1	4	1	5	..	..	2	..	43	..	..	..
Washington	153	1	..	..	12	1	..	..	..	..	2	..	..	1	6	..	2	1	..	5	..	6	17	..	19	1	..	..	..	..	..	..	..	..	6	..	12	5	..	..	..	1	..	4	1	5	..	..	..	1	..	11	..	..	..
West Virginia	53	..	..	..	2	..	..	..	..	..	2	..	5	..	1	1	1	2	1	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	5	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	53	..	..	..	..
Wisconsin	86	..	..	..	..	..	..	..	..	..	..	..	16	..	..	1	..	..	..	1	..	4	2	1	1	..	..	..	..	..	..	..	..	..	4	..	..	2	..	..	..	..	..	..	..	1	..	..	1	..	..	2	..	..	..
Wyoming	16	..	..	..	1	..	..	..	..	1	..	..	3	..	..	..	..	..	1	..	..	..	1	..	..	..	1	3	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Alaska, Hawaii, Puerto Rico and Virgin Islands	41	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	1	..	3	..	2	..	..	..	..	3	1	..	..	..	..	3	..	..	..	..	..	..	..	..	..	1	..	..	21	..	..	..
Totals	6,929	17	4	50	143	42	17	7	34	4	64	3	372	128	112	100	92	154	27	205	24	192	185	36	233	8	133	2	6	72	2	305	59	7	253	65	23	325	5	24	10	192	87	11	27	133	36	23	132	0	103	2,536	11	68	26
Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

possessions are presented in tables 12 and 13. Included in these compilations are figures pertaining to candidates examined and licensed in 1949, figures for some who were examined in previous years but whose licenses were not issued until 1949 because of the lack of the required internship, citizenship or other technicalities, and figures for physicians not previously licensed in any state who were certified in earlier years by the National Board of Medical Examiners. The figures also include physicians licensed on the basis of governmental credentials, Canadian and foreign licenses. The majority represent recent graduates.

These official figures indicate that last year 5,866 individuals were added to the physician population in this country, Alaska, Hawaii and Puerto Rico. In 1949 there were 3,600 deaths of physicians reported to the offices of the American Medical Association. Deducting this figure from the number licensed in 1949 for the first time reveals that the net increase in the number of physicians in the United States and its territories and possessions was 2,266. This figure represents a decrease of 760 in comparison with the net increase in 1948.

The greatest number of physicians licensed for the first time in any one state was 973 in New York. California had more than 500 first licentiates and Pennsylvania more than 400. Increases over 1948 were reported by Arizona, Idaho, Kansas, Kentucky, Maryland, Mississippi, Ohio and Oregon.

The 5,866 first licentiates in 1949 consisted of 4,250 who were registered after a written examination and 1,616 by endorsement of credentials. The majority of the latter were diplomates certified by the National Board of Medical Examiners.

Table 13 presents the same figures as those in table 12 for nine geographic divisions. The East North Central and Middle Atlantic group of states had the greatest number of first licentiates 1,027 and 1,524 respectively. More than 600 were reported by the West North Central and South Atlantic and Pacific states. The West South Central states reported 414, the East South Central states 290, the Mountain group 155 and the New England states 453. The territories and possessions added 30.

In the past 15 years (1935-1949) there have been 93,074 physicians added to the medical profession. Figures for each year during this period are shown in table 14 and indicate that 80,932 were licensed after examination and 12,142 by endorsement of credentials. The total number of licenses issued in the same period was 155,935.

The American Medical Directory, Volume 18, which will be ready for distribution in June lists the total number of physicians in continental United States as 201,277. This total 201,277 includes all licensed physicians including those in private practice, those in full time research, teaching and administration, those in government services, those who have retired, and interns and residents. It is estimated that 151,267 physicians are in private practice.

Premedical Training

Since 1918 the minimum requirement of the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges has been two years of college training. In 1938 both these agencies recommended that at least three years of college work be required of all candidates for admission. All state licensing boards with the exception of California (table 15) require that an applicant for licensure must present evidence of having completed two years of college. Seventy-three medical and basic science schools of the United States and four Canadian medical schools require three or more years of premedical work. Six schools require a bachelor's degree. One of these latter schools requires only 90 semester hours of college work from veterans and two of these schools will accept students with three years of college work, provided their colleges will grant them a bachelor's degree on the successful completion of the first year in medical school.

Required Internships

The medical schools that require their students to serve an internship are shown in table 16. Seven schools in the United States and three in Canada have this requirement. All except one of these schools withholds the M.D. degree until the year of internship has been served. Duke issues the degree at the end of the four year medical course, but obtains from each student a written agreement that he will spend two years in training in a hospital or laboratory. Several of the other schools requiring an internship will accept a year of laboratory work in lieu of an internship.

States requiring an internship for licensure are listed in table 17. Twenty-three states have this requirement. In addition, the District of Columbia, Alaska, Hawaii, Puerto Rico, the Virgin Islands and the Canal Zone require a year of internship for licensure. Eleven states, the Canal Zone, Hawaii and Puerto Rico require the internship to be a rotating service. Idaho specifies the internship should be a straight service.

Some states in addition to those listed in table 17 require an internship of foreign-trained physicians and of applicants for reciprocity or endorsement.

Licensure Requirements for Interns and Residents

Two states and Puerto Rico report that physicians serving internships must be licensed. Georgia and Nevada have this requirement. Limited registration is required in Massachusetts. Two states permit an intern service of two years without licensure and one state three years of internship without licensure.

The legal requirements for physicians engaged in residency training varies. Twenty-two states, Alaska, the Canal Zone, Hawaii and the Virgin Islands do not require licensure. California will permit a physician to begin a residency before licensure. One state permits a service of two years and another a three year service before licensure.

The requirements for each state are given in table 18.

Professional Educational Requirements of Licensing Boards

The medical practice acts or board regulations of several state medical boards specify the length of the medical school academic year in terms of hours, weeks or months as well as the total time in hours, weeks or months which must be spent in medical school. In other states the law or ruling reads that the professional educational requirement accepted for approval by the Council on Medical Education and Hospitals of the American Medical Association or for membership in the Association of American Medical Colleges is the regulation for licensure. Table 19 outlines the requirement of each state in this respect. This table does not record the internship which is a requirement for licensure by 29 boards.

TABLE 11.—*Candidates Licensed by*

Marginal Number	SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland
	ALABAMA																			
1	Medical College of Alabama, Birmingham	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..
	ARKANSAS																			
2	University of Arkansas School of Medicine, Little Rock	3	3	..	9	..	..	..	4	..	..	..	4	2	..	3	1	4	..	2
	CALIFORNIA																			
3	University of California Medical School, San Francisco	..	..	..	1	..	1	..	1	..	..	..	..	..	1	1	..	..	..	..
4	College of Medical Evangelists, Loma Linda-Los Angeles	..	2	1	12	5	1	..	2	..	2	5	3	..	2	..	3	1	2	7
5	Univ. of Southern California School of Med., Los Angeles	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	Stanford University School of Medicine, Stanford Univ.-San Francisco	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..
	COLORADO																			
7	University of Colorado School of Medicine, Denver	..	3	..	10	..	..	..	..	..	..	..	2	..	1	..	1	2	..	..
	CONNECTICUT																			
8	Yale University School of Medicine, New Haven	..	..	..	10	1	35	..	..	..	1	..	3	..	2	2	..	..	..	1
	DISTRICT OF COLUMBIA																			
9	George Washington University School of Med., Washington	1	2	1	14	..	2	..	38	..	1	1	1	2	..	2	..	..	..	23
10	Georgetown University School of Medicine, Washington	..	1	..	14	..	1	..	34	..	1	..	..	3	..	..	..	..	2	15
11	Howard University College of Medicine, Washington	2	..	..	2	..	1	1	5	..	2	..	..	..	1	1	..	..	..	1
	GEORGIA																			
12	Medical College of Georgia, Augusta	3	..	..	3	1	..	..	..	..	..	..	..	..	..	1	1	1	..	..
13	Emory University School of Medicine, Emory University	3	..	..	6	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..
	ILLINOIS																			
14	Northwestern University Medical School, Chicago	1	3	2	56	8	4	..	1	..	1	..	23	7	5	2	2	3	..	2
15	Stritch School of Medicine of Loyola University, Chicago	..	..	1	34	..	1	..	..	..	..	..	5	4	2	1	1	1	1	..
16	University of Chicago, The School of Medicine, Chicago	..	1	..	16	..	..	..	1	..	..	..	10	2	2	2	..	2	..	1
17	University of Illinois College of Medicine, Chicago	2	5	1	51	7	1	..	..	..	..	..	10	8	9	2	4	1	..	..
	INDIANA																			
18	Indiana University School of Med., Bloomington-Indianapolis	..	1	..	31	2	1	..	3	..	3	1	7	..	..	4	6	2	..	1
	IOWA																			
19	State University of Iowa College of Medicine, Iowa City	3	2	1	22	3	..	..	..	..	..	..	12	2	14	1	2	..	..	1
	KANSAS																			
20	University of Kansas School of Med., Lawrence-Kansas City	1	1	2	17	1	..	..	..	..	..	..	2	4	6	..	..	..	2	..
	KENTUCKY																			
21	University of Louisville School of Medicine, Louisville	2	..	..	14	1	1	..	1	..	1	..	6	10	4	1	3	2	..	1
	LOUISIANA																			
22	Louisiana State University School of Medicine, New Orleans	10	..	2	5	..	1	..	1	..	1	..	..	..	..	..	1	..	..	3
23	Tulane University of Louisiana School of Med., New Orleans	7	..	3	9	..	3	..	2	..	7	..	1	2	1	4	3	5	..	2
	MARYLAND																			
24	Johns Hopkins University School of Medicine, Baltimore	1	1	..	9	..	3	..	5	..	2	1	3	4	..	1	2	2	1	1
25	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	..	1	1	13	..	..	..	5	..	1	..	1	..	..	..	1	..	1	3
	MASSACHUSETTS																			
26	Boston University School of Medicine, Boston	..	..	..	11	..	3	..	2	..	..	..	3	..	..	3	1	..	2	..
27	Harvard Medical School, Boston	1	..	1	23	1	9	1	4	..	1	..	8	1	3	3	1	1	5	4
28	Tufts College Medical School, Boston	..	1	..	13	..	7	..	3	..	..	1	..	3	1	1	1	1	9	..
	MICHIGAN																			
29	University of Michigan Medical School, Ann Arbor	1	6	1	21	1	1	..	1	..	3	1	4	7	..	2	..	2	1	3
30	Wayne University College of Medicine, Detroit	..	2	..	21	..	2	..	..	..	..	..	4	1	..	..	..	..	..	..
	MINNESOTA																			
31	University of Minnesota Medical School, Minneapolis	..	3	1	50	5	3	..	..	..	1	..	2	4	8	1	..	1	1	..
	MISSOURI																			
32	St. Louis University School of Medicine, St. Louis	..	2	1	20	1	2	..	1	..	..	1	10	6	1	2	..	1	..	..
33	Washington University School of Medicine, St. Louis	6	..	..	19	1	..	..	3	..	1	..	16	1	1	3	..	3	..	2
	NEBRASKA																			
34	Creighton University School of Medicine, Omaha	..	1	1	11	2	1	..	..	..	..	..	1	1	4	2	..	..	..	..
35	University of Nebraska College of Medicine, Omaha	..	4	..	33	12	1	..	..	..	..	..	4	5	18	5	..	..	..	..
	NEW YORK																			
36	Albany Medical College, Albany	1	1	..	6	..	5	..	2	..	..	..	..	..	1	1	1	1	..	2
37	Long Island College of Medicine, Brooklyn	..	1	..	18	1	9	1	..	..	..	..	..	1	1	..	..	..	2	3
38	University of Buffalo School of Medicine, Buffalo	..	3	..	10	..	3	..	2	..	..	..	2	3	2	..	..	..	..	1
39	Columbia University College of Physicians and Surgeons, New York	2	..	..	19	3	16	1	2	..	..	1	4	..	1	..	1	2	1	3
40	Cornell University Medical College, New York	3	3	..	16	..	11	..	2	..	..	..	1	1	2	1	2	..	2	2
41	New York Medical College, Flower and Fifth Avenue Hospitals, New York	..	..	..	16	1	9	..	1	..	1	2	2	..	..	1	..	1	..	1
42	New York University College of Medicine, New York	..	..	1	45	..	8	..	6	..	..	..	2	1	1	..	..	2	1	5
43	Univ. of Rochester School of Med. and Dent., Rochester	..	1	..	12	1	3	..	..	..	..	..	1	1	1	1	..	..	1	..
44	Syracuse University College of Medicine, Syracuse	..	..	..	5	1	2	..	..	..	1	..	1	1	..	..	1	..	1	1
	NORTH CAROLINA																			
45	Duke University School of Medicine, Durham	2	1	..	7	..	5	..	4	..	4	..	1	..	..	2	2	..	..	1
46	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	3	..	..	2	..	..	..	1	..	1	..	1	..	..	1	..	1	..	..
	OHIO																			
47	University of Cincinnati College of Medicine, Cincinnati	1	..	..	17	..	2	..	2	..	..	..	4	9	6	1	5	..	1	1
48	Western Reserve University School of Medicine, Cleveland	..	1	..	19	..	..	..	1	..	..	..	4	4	3	1	..	..	..	..
49	Ohio State University College of Medicine, Columbus	..	1	2	7	..	..	..	..	..	..	..	1	4	..	3	2	..	1	..
	OKLAHOMA																			
50	University of Oklahoma School of Medicine, Oklahoma City	..	..	1	13	4	1	..	..	..	1	..	5	4	..	2	..	3	..	1
	OREGON																			
51	University of Oregon Medical School, Portland	..	2	..	12	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..
	PENNSYLVANIA																			
52	Hahnemann Medical College and Hospital of Philadelphia	1	2	1	15	..	..	2	1	..	1	..	3	3	2	1	..	1	..	1
53	Jefferson Medical College of Philadelphia	3	2	..	14	2	1	1	4	..	1	..	2	1	..	3	1	..	..	5
54	Temple University School of Medicine, Philadelphia	..	2	..	12	..	2	..	4	..	..	..	1	3	1	1	..	..	..	2
55	University of Pennsylvania School of Medicine, Philadelphia	1	2	1	16	2	4	..	6	..	2	..	6	2	2	3	2	4	..	3
56	Woman's Medical College of Pennsylvania, Philadelphia	..	1	..	2	1	1	..	2	..	2	..	..	1	1	..	1	1	..	1
57	University of Pittsburgh School of Medicine, Pittsburgh	..	1	..	22	1	2	..	2	..	1	..	3	..	1	..	1	1	..	1

Reciprocity and Endorsement, 1949

Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Marginal Number
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4	1
1	..	..	2	3	1	..	..	..	..	..	2	1	1	3	1	1	..	..	1	..	1	3	..	..	..	1	..	..	..	..	57	2
..	..	1	1	1	1	..	..	..	1	..	4	1	..	2	..	..	..	..	..	..	..	2	1	..	..	..	1	1	1	..	23	3
4	6	1	2	..	..	3	2	..	..	..	1	5	1	1	4	8	..	..	1	..	4	11	2	..	1	13	..	..	..	2	120	4
..	1	..	..	..	..	..	2	..	..	..	4	1	..	..	..	..	2	..	..	..	..	1	..	..	..	..	1	..	..	..	13	5
..	..	2	..	..	..	..	2	..	..	..	2	1	..	1	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	15	6
..	..	7	..	..	..	..	..	..	..	1	5	1	..	1	1	3	1	..	..	1	..	3	..	..	..	1	..	..	..	..	44	7
11	2	2	1	1	..	..	..	3	4	..	16	1	..	2	3	..	2	1	..	..	..	..	..	..	1	3	1	..	1	2	112	8
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15	1	1	..	..	1	..	..	..	..	2	..	4	1	..	4	..	..	3	..	..	..	1	3	..	..	2	..	..	..	..	..	39	11
1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	..	3	..	3	1	..	..	1	1	1	..	..	..	23	12
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2	9	7	2	2	1	4	..	..	2	2	5	2	2	11	2	4	5	..	1	1	..	6	3	..	..	8	3	7	..	2	213	14
..	2	1	1	..	1	..	1	..	3	..	3	..	..	1	..	2	2	..	..	..	..	3	..	..	1	..	..	7	..	..	79	15
..	6	..	..	1	1	..	..	..	..	..	3	..	1	..	2	5	1	..	..	..	2	4	..	..	1	1	..	1	..	..	66	16
1	5	..	1	3	3	..	..	3	..	2	9	..	3	8	1	3	1	..	..	..	2	13	..	..	..	1	1	13	2	1	176	17
..	13	2	..	1	1	..	..	..	3	1	5	2	..	9	..	1	1	..	..	1	1	15	1	..	..	1	..	..	..	..	120	18
1	10	5	..	3	..	2	1	..	1	1	7	..	..	7	2	7	1	..	..	1	..	9	..	..	..	6	2	..	..	..	129	19
..	3	..	..	22	..	3	1	..	3	..	1	..	1	1	6	..	1	..	1	..	1	8	1	..	1	..	1	1	..	..	87	20
1	1	2	1	4	..	..	1	..	4	..	8	..	..	13	1	1	4	..	1	3	4	7	1	..	4	3	1	1	..	..	113	21
..	1	..	5	..	..	..	..	..	..	1	1	..	..	1	1	..	..	..	..	..	1	12	..	..	..	1	..	..	..	..	48	22
4	4	2	8	1	..	..	..	..	3	2	15	1	..	1	4	..	..	..	..	..	3	26	..	..	2	..	2	1	..	..	128	23
7	6	3	..	..	..	..	..	1	2	..	17	3	1	3	1	..	10	..	1	1	1	4	2	1	5	3	..	1	..	..	109	24
2	3	..	..	..	1	..	..	..	4	..	19	6	..	5	..	1	6	..	1	..	1	5	..	..	3	3	2	1	..	1	91	25
35	1	..	..	..	..	..	1	4	..	1	12	..	..	1	..	..	4	2	..	..	..	..	..	1	2	..	3	..	..	..	92	26
48	7	9	..	6	..	..	..	8	2	2	38	3	..	7	..	5	2	5	..	1	4	6	1	2	1	7	1	..	1	2	235	27
89	5	1	..	2	..	1	..	9	4	1	17	1	..	2	..	..	5	6	..	..	3	4	..	5	2	2	1	2	..	..	203	28
3	6	8	..	4	4	..	..	1	2	1	15	2	1	15	..	2	2	..	..	..	1	2	..	..	3	5	1	4	..	3	140	29
..	..	..	..	2	2	..	..	..	..	..	8	..	2	6	..	1	2	..	..	1	1	1	..	..	..	2	..	1	..	..	59	30
2	11	6	..	..	2	..	..	1	1	1	9	..	..	5	..	11	1	..	..	5	2	1	..	..	..	10	..	2	1	1	152	31
..	5	6	..	3	..	4	..	..	2	..	4	1	..	18	3	3	4	..	..	..	..	10	1	..	2	11	..	3	..	2	130	32
1	5	2	..	2	2	1	1	..	2	1	..	2	..	6	2	3	2	..	..	..	2	10	3	..	3	9	..	1	..	1	117	33
..	3	2	..	7	..	10	..	..	1	..	1	..	..	..	1	1	..	..	..	3	..	..	1	1	1	1	..	4	2	1	64	34
1	2	7	1	4	1	4	..	..	1	1	1	..	..	4	3	3	3	..	..	2	..	7	1	..	1	..	..	1	2	..	132	35
7	1	..	..	1	..	1	..	..	4	..	34	1	..	4	..	..	4	..	..	..	..	..	..	4	2	..	..	..	..	1	85	36
3	1	2	..	1	..	..	4	22	..	..	70	1	..	2	..	..	4	1	1	..	..	1	..	1	2	1	1	1	..	..	156	37
1	1	..	..	1	..	..	1	..	2	..	55	1	..	4	1	..	4	1	..	..	..	3	..	1	1	..	..	..	..	..	103	38
12	1	4	..	..	..	..	..	1	14	2	66	2	..	4	..	..	7	1	..	..	1	4	1	4	5	3	1	2	..	..	191	39
3	2	..	..	..	1	..	..	1	10	..	49	2	..	..	..	..	6	..	1	..	2	4	1	..	1	1	1	..	..	..	131	40
8	2	1	..	..	..	..	..	..	16	..	88	2	..	2	1	..	7	1	..	1	1	3	2	1	1	1	..	..	..	..	173	41
8	2	..	..	1	..	..	..	1	23	..	116	2	..	5	..	1	5	..	1	..	1	2	..	1	..	..	2	2	..	..	245	42
2	..	2	..	2	1	..	1	2	3	1	38	..	..	7	..	..	2	..	..	..	..	..	..	1	..	2	..	..	..	..	86	43
2	2	2	..	..	..	1	..	..	1	..	18	1	..	1	..	..	3	..	..	..	..	..	2	..	1	..	..	..	..	1	49	44
..	2	1	2	1	..	..	..	..	3	1	9	21	..	3	3	..	1	..	8	..	..	2	..	1	3	1	2	..	..	1	94	45
..	..	..	..	..	..	..	..	..	1	..	2	..	1	1	..	..	1	..	1	..	..	..	..	..	3	..	..	..	..	..	20	46
3	11	..	..	1	3	1	..	1	1	1	7	2	..	1	..	..	1	1	..	2	2	4	..	..	1	1	1	1	1	..	93	47
3	3	2	..	..	1	1	..	..	2	..	2	..	1	3	1	1	2	..	..	..	..	3	..	..	3	3	1	1	..	..	66	48
..	11	1	..	..	..	3	..	..	1	1	1	..	..	..	1	..	3	..	..	..	1	2	..	..	2	..	1	1	..	..	50	49
..	3	3	..	4	..	..	..	..	1	1	..	..	..	2	2	1	1	..	..	..	..	15	..	..	5	..	..	..	..	..	73	50
2	..	..	..	1	..	1	..	..	..	..	1	..	..	..	..	16	1	..	..	..	..	..	1	..	1	12	..	..	..	2	54	51
1	4	..	1	..	..	..	1	2	15	..	9	1	..	10	..	..	25	1	..	..	1	1	1	..	2	..	1	..	..	2	112	52
7	4	1	..	1	1	1	2	1	13	2	11	6	..	3	1	1	21	..	..	..	2	6	1	..	3	2	1	..	..	1	132	53
2	4	..	2	..	2	..	1	1	12	..	12	2	3	2	1	1	12	..	1	..	2	1	1	..	2	4	1	..	..	1	98	54
10	11	3	3	..	..	..	2	1	15	1	15	2	..	5	..	2	34	..	..	..	2	8	..	1	2	4	2	..	1	3	183	55
3	..	1	..	2	..	..	..	1	1	..	7	1	..	2	..	..	4	..	..	..	..	1	..	..	..	2	..	..	..	2	40	56
1	2	1	..	1	..	1	..	1	1	..	6	1	..	13	1	..	3	..	1	..	..	1	..	..	3	..	..	2	..	..	75	57

TABLE 11.—*Candidates Licensed by Reciprocity*

Marginal Number	SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland
	SOUTH CAROLINA																			
58	Medical College of the State of South Carolina, Charleston	1	..	..	3	1	..	..	1	..	2	..	..	..	..	..	..	..	..	..
	TENNESSEE																			
59	University of Tennessee College of Medicine, Memphis	7	..	6	10	1	2	..	..	..	5	..	1	1	3	2	5	12	..	..
60	Meharry Medical College, Nashville	3	..	2	8	1	2	..	3	..	1	..	3	1	2	2	..	..	..	1
61	Vanderbilt University School of Medicine, Nashville	7	..	3	4	1	..	..	3	..	5	..	2	..	2	1	6	3	..	3
	TEXAS																			
62	Southwestern Medical School of the Univ. of Texas, Dallas	..	1	..	..	..	..	..	..	..	..	..	..	..	1	1	..	4	..	1
63	University of Texas School of Medicine, Galveston	..	..	..	2	3	..	..	3	..	2	..	3	2	..	2	1	3	1	1
64	Baylor University College of Medicine, Houston	..	..	..	7	1	..	..	..	..	..	..	1	3	..	1	1	3	..	..
	UTAH																			
65	University of Utah School of Medicine, Salt Lake City	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	VERMONT																			
66	University of Vermont College of Medicine, Burlington	..	..	..	3	..	5	..	2	..	..	..	2	..	..	..	..	..	2	..
	VIRGINIA																			
67	University of Virginia Department of Med., Charlottesville	2	..	..	4	..	1	..	5	..	4	..	1	1	1	..	2	3	..	..
68	Medical College of Virginia, Richmond	..	..	1	5	..	1	1	4	..	2	..	..	3	..	..	1	1	..	6
	WISCONSIN																			
69	University of Wisconsin Medical School, Madison	1	2	..	15	2	2	..	1	..	..	..	4	2	3	1	..	2	..	..
70	Marquette University School of Medicine, Milwaukee	..	..	..	13	3	1	..	2	..	..	..	7	1	2	..	..	..	..	..
	CANADA																			
71	University of Alberta Faculty of Medicine, Edmonton, Alta.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
72	University of Manitoba Faculty of Med., Winnipeg, Man.	..	..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
73	Dalhousie University Faculty of Medicine, Halifax, N. S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74	University of Toronto Faculty of Medicine, Toronto 5, Ont.	..	1	1	8	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..
75	Queen's University Faculty of Medicine, Kingston, Ont.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	Univ. of Western Ontario Faculty of Med., London, Ont.	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
77	McGill University Faculty of Medicine, Montreal, Que.	..	..	..	5	..	4	..	..	..	..	..	1	..	..	1	..	..	..	..
78	University of Montreal Faculty of Medicine, Montreal, Que	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	Laval University Faculty of Medicine, Quebec, Que.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
	OTHERS																			
80	Foreign Medical Faculties	..	1	..	3	..	8	1	10	..	1	..	..	1	3	..	..	..	1	..
81	Extinct Medical Schools	2	1	..	39	2	..	..	1	..	1	..	5	4	3	2	2	..	1	4
82	Unapproved Medical Schools	..	1	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	2	..
83	Schools of Osteopathy	..	..	..	..	..	..	1	1	..	..	..	..	1	..	..	..	..	..	..
84	TOTALS	88	77	39	1,027	83	197	10	197	...	70	15	220	139	132	86	72	86	44	123
	Marginal Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Approval of Medical Schools

Eight states maintain their own list of approved medical schools in the United States and Canada. Five of these states accept the list of medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association. Twenty boards require applicants for medical licensure from medical schools in the United States to be graduates of medical schools approved by the Council. One state requires membership in the Association of American Medical Colleges, while 25 boards require that schools be approved by the Council and be in membership in the Association of American Medical Colleges.

Schedule of Written Examination Dates and Reciprocity Meetings

The current schedules of the licensing boards for written examination for medical licensure and meetings for the issuance of reciprocity or endorsement of credentials are given in table 20. To meet the demands for licensure in recent years as a result of the increase in the numbers of candidates seeking licensure, examination dates and reciprocity meetings have been scheduled at more frequent intervals and are arranged to coincide closely with the examination dates of basic science boards. This is particularly true with regard to the issuance of licenses without examination. In some states temporary permits are granted enabling physicians to begin the practice of medicine immediately.

Temporary Licenses

The licensing boards of 17 states, Alaska, Puerto Rico and the Virgin Islands provide for the issuance of temporary permits. The names of these states, the length of validity of the permit, and the number of permits granted during 1949 are shown in table 21. Delaware, Maine, Oklahoma and the Virgin Islands initiated this service for the first time in 1949. Maine issues permits to summer camp physicians, Indiana and Nebraska to reciprocity applicants until licensure is perfected while Puerto Rico and Virgin Islands grant this privilege to physicians in government positions only. There were 615 permits issued by 15 boards, four issued none while one board did not maintain a numerical record.

Licensure on Government Credentials

The medical practice acts of most states do not provide for the acceptance of government credentials as a basis for licensure without examination. The licensing boards of California, Illinois, Pennsylvania, Rhode Island, Texas, Virginia, Puerto Rico and the Virgin Islands will issue a license to a physician who has passed an examination for admission to the medical corps of the United States Army, United States Navy or the Public Health Service. Texas limits its recognition to the Army and Navy. Legal residents of Pennsylvania who were qualified to take the state board examination but were prevented from doing so by reason of enlistment or induction into the military or naval forces of the United States are licensed without examination in that state.

Medical License Fees

Table 22 lists for each state, territory and possession the fee charged by the medical licensing board for registration by examination and also by reciprocity or endorsement of credentials. The examination fee tends to be uniform, the majority of the boards charging a

and Endorsement, 1949—Continued

Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Marginal Number
1	..	..	1	..	..	..	..	..	..	1	..	8	..	2	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	24	58
..	5	1	11	6	1	1	1	..	2	1	..	3	..	4	3	..	..	..	..	..	4	6	1	..	5	1	..	1	..	..	114	59
..	..	..	1	3	..	1	..	..	1	..	1	1	..	5	..	..	3	..	..	..	1	3	..	..	2	1	..	..	..	..	52	60
..	1	2	2	..	..	..	1	1	2	..	3	2	..	..	2	..	1	..	4	..	1	3	..	..	3	..	..	..	..	1	69	61
..	..	..	..	1	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	13	62
..	1	..	..	1	..	..	..	..	1	2	7	2	..	..	3	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	41	63
..	1	1	1	1	..	..	..	..	..	4	1	1	..	1	..	..	..	..	2	..	..	..	1	..	..	..	1	..	..	..	32	64
..	..	1	..	1	..	..	..	..	1	..	2	..	..	..	..	1	..	..	..	..	..	..	5	..	..	3	..	..	..	..	16	65
11	2	2	..	..	..	..	..	3	3	..	14	..	1	4	..	..	4	1	..	..	..	..	..	3	..	1	..	..	..	..	63	66
1	2	2	1	2	..	..	..	..	1	1	7	2	..	5	1	..	4	..	5	1	3	..	1	..	3	4	6	1	..	2	79	67
..	4	2	..	2	..	..	..	..	1	..	5	11	..	3	..	..	1	..	..	1	3	5	..	1	3	1	6	..	..	1	75	68
..	2	3	..	3	1	1	..	..	2	1	6	..	..	..	..	2	..	..	..	1	..	2	..	..	..	1	1	7	..	..	68	69
..	7	7	..	3	1	..	..	..	..	..	13	..	..	..	..	3	1	..	..	1	..	2	..	..	..	2	..	10	1	2	82	70
..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	71
1	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	72
..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	6	73
..	..	..	1	..	..	..	..	..	2	..	11	..	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	30	74
..	..	..	3	1	..	..	..	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	75
..	..	..	2	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	8	76
3	..	1	..	..	1	1	1	2	..	2	15	1	..	3	1	1	..	..	..	..	..	1	..	4	1	..	..	..	..	..	49	77
..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	78
..	..	..	..	..	..	..	..	..	2	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	6	79
2	1	..	..	..	..	1	..	3	30	2	64	1	..	12	..	..	..	..	..	..	..	1	..	..	2	1	..	..	1	2	152	80
..	..	..	1	4	2	..	2	1	1	..	1	1	1	5	..	1	1	..	..	..	2	10	..	..	2	..	2	2	1	..	107	81
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	7	82
3	..	..	..	..	..	..	..	4	1	..	2	..	..	4	..	5	..	..	..	..	..	9	..	..	..	..	..	1	..	..	32	83
39	215	128	61	122	36	47	26	66	270	44	1,041	128	24	278	61	103	247	25	40	29	78	292	38	34	123	153	53	86	16	41	6,929	84
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50		

fee of $25. The fee for a license without examination varies from $20 to $200. In a few instances boards report that the fee will be the same as that charged by the reciprocating state.

Annual Registration

Thirty states, the District of Columbia, Alaska and Hawaii require physicians to register their license annually or biennially. In table 23 are listed the licensing boards which exact this requirement and the fee charged for such registration. In general, the licensing boards require such registration whether or not the physician resides in the state. The fee ranges from $1 to $10. No fee is charged for this registration in Georgia. Minnesota and New York require biennial registration. Florida has discontinued this requirement.

Candidates Examined for Medical Licensure, 1945-1949

In table 24 are tabulated the number of candidates examined for medical licensure in the United States and its territories and possessions for the five year period, 1945-1949. For each year there is recorded the number who passed and failed licensing examinations. Totals for the five years and the percentage of failures for five years are also given.

In the five year period shown 33,291 examinations were given; 29,736 were successful tests and 3,555, or 10.7 per cent, resulted in failures. California leads in the number of examinations given. In this state 2,485 applicants were examined of whom 125 or 5 per cent failed. More than 2,000 candidates were successful in Illinois, New York and Pennsylvania and more than 1,000 in Florida, Minnesota, Missouri, Ohio and Texas.

The greatest percentage of failures, 62.8 per cent, occurred in Massachusetts. The majority of those who failed in this state represent graduates of unapproved medical schools and schools of osteopathy. The number failing in this state in 1949 was the lowest in the five year period and will probably further decrease, since the unapproved schools whose graduates the board was required by law to examine are no longer in operation. The State Approving Authority has furthermore ruled that students matriculating after Jan. 1, 1941 in institutions not meeting the standards of this authority will not be eligible for licensure.

New York's percentage of failures was the second highest, 46.6 per cent. This state examines a considerable number of graduates of foreign medical schools, many of whom do not pass their first examination. Regulations permitting certain graduates of unapproved and osteopathic schools to its licensure examination also contributed to the high percentage of failures in this state.

Seven other states had more than 10 per cent failures in five years. Twenty-six states failed less than 5 per cent of those examined in the five year period. Nine states had no failures. In five years only one physician was examined for licensure in Wyoming and was licensed.

The annual percentage of failures for all boards has varied from 9.9 per cent to 12.5 per cent. The highest percentage was in 1949.

The foregoing figures represent examinations given and not individuals. A candidate who fails more than once in a state in a given year is counted only once,

but should he again fail in a succeeding year this fact is computed among the failures for that year. In compiling the tabulations in this study, a successful candidate securing a license in more than one state in a given year is counted in both states and likewise counted if he passed at examinations in later years. The totals in this table give only a fair approximation of the number of physicians added to the profession after written examination during the last five years. Table 14 gives the exact compilation of the number of physicians who constitute new additions to the medical profession.

TABLE 12.—*Licentiates Representing Additions to the Medical Profession, 1949*

	Examination	Reciprocity and Endorsement	Total
Alabama	13	5	18
Arizona	13	3	16
Arkansas	52	0	52
California	416	87	503
Colorado	71	6	77
Connecticut	26	65	91
Delaware	8	1	9
District of Columbia	24	60	84
Florida	63	0	63
Georgia	108	2	110
Idaho	7	5	12
Illinois	262	32	294
Indiana	94	4	98
Iowa	59	15	74
Kansas	96	5	101
Kentucky	86	6	92
Louisiana	157	0	157
Maine	19	13	32
Maryland	170	17	187
Massachusetts	55	196	251
Michigan	190	19	209
Minnesota	112	30	142
Mississippi	30	6	36
Missouri	192	18	210
Montana	5	0	5
Nebraska	52	3	55
Nevada	2	1	3
New Hampshire	7	21	28
New Jersey	75	46	121
New Mexico	2	1	3
New York	296	677	973
North Carolina	87	22	109
North Dakota	13	3	16
Ohio	287	43	330
Oklahoma	66	12	78
Oregon	39	11	50
Pennsylvania	356	74	430
Rhode Island	8	16	24
South Carolina	43	4	47
South Dakota	6	2	8
Tennessee	135	9	144
Texas	121	6	127
Utah	29	7	36
Vermont	14	13	27
Virginia	109	13	122
Washington	44	14	58
West Virginia	21	4	25
Wisconsin	86	10	96
Wyoming	1	2	3
Alaska, Hawaii and Puerto Rico	33	7	40
Total	4,250	1,616	5,866

Registration of Physicians, 1904-1949

A recapitulation of the totals discussed in the tables presented in this study for 46 years (1904-1949) is included in table 25. This tabulation includes the number of physicians examined and registered by written examination, the annual percentage of failures, the number registered annually by reciprocity or endorsement of credentials and the total registered. No obvious trend in the numbers registered is evident from 1904 to 1933 except in 1918, when 4,231 were licensed, the lowest registration in 46 years. This decrease was occasioned by World War I. By contrast, in 1943 the number registered increased 1,240 as the result of the accelerated curriculum in the medical schools and the efforts made to maintain civilian care during World War II at as high a level as possible and still provide for the needs of the military. In 1943 more physicians were examined than in any previous year.

The number registered in 1946 was almost double the number registered in 1945. Separation from service of a large number of medical officers and their return to private practice in states other than those in which they were previously licensed and of recent graduates who entered the military service on completion of their

TABLE 13.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1949*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	19	13	32
New Hampshire	7	21	28
Vermont	14	13	27
Massachusetts	55	196	251
Rhode Island	8	16	24
Connecticut	26	65	91
	129	324	453
Middle Atlantic			
New York	296	677	973
New Jersey	75	46	121
Pennsylvania	356	74	430
	727	797	1,524
East North Central			
Ohio	287	43	330
Indiana	94	4	98
Illinois	262	32	294
Michigan	190	19	209
Wisconsin	86	10	96
	919	108	1,027
West North Central			
Minnesota	112	30	142
Iowa	59	15	74
Missouri	192	18	210
North Dakota	13	3	16
South Dakota	6	2	8
Nebraska	52	3	55
Kansas	96	5	101
	530	76	606
South Atlantic			
Delaware	8	1	9
Maryland	170	17	187
District of Columbia	24	60	84
Virginia	109	13	122
West Virginia	21	4	25
North Carolina	87	22	109
South Carolina	43	4	47
Georgia	108	2	110
Florida	63	0	63
	633	123	756
East South Central			
Kentucky	86	6	92
Tennessee	135	9	144
Alabama	13	5	18
Mississippi	30	6	36
	264	26	290
West South Central			
Arkansas	52	0	52
Louisiana	157	0	157
Oklahoma	66	12	78
Texas	121	6	127
	396	18	414
Mountain			
Montana	5	0	5
Idaho	7	5	12
Wyoming	1	2	3
Colorado	71	6	77
New Mexico	2	1	3
Arizona	13	3	16
Utah	29	7	36
Nevada	2	1	3
	130	25	155
Pacific			
Washington	44	14	58
Oregon	39	11	50
California	416	87	503
	499	112	611
Territories and Possessions			
Alaska, Hawaii and Puerto Rico	33	7	40
Totals	4,250	1,616	5,866

internship and before securing state licensure was the primary factor in this increase.

The percentage of failures gradually dropped from 19.3 in 1904, when a great many proprietary medical schools were functioning, to 5.7 in 1930. In the years since 1930 the percentage of failures increased reaching another peak of 20.7 per cent in 1940. This was the result of the increase in the number of foreign-trained physicians seeking licensure in the United States, many of whom are not successful after repeated attempts at licensure examinations.

This table again refers to examinations given annually rather than individuals examined.

TABLE 14.—*Licentiates Representing Additions to the Medical Profession, 1935-1949*

	Examination	Reciprocity and Endorsement	Total
1935	5,009	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,241	474	5,715
1942	5,560	454	6,014
1943	5,586	372	5,958
1944	6,495	470	6,965
1945	4,979	769	5,748
1946	5,392	1,698	6,990
1947	5,273	1,617	6,890
1948	4,942	1,694	6,636
1949	4,260	1,616	5,876
Totals	80,932	12,142	93,074

TABLE 15.—*Requirements of Premedical Training by Medical Licensing Boards*

Two Years or More of College

Alabama	Massachusetts	Rhode Island
Arizona	Michigan	South Carolina
Arkansas	Minnesota	South Dakota
Colorado	Mississippi	Tennessee
Connecticut	Missouri	Texas
Delaware	Montana	Utah
District of Columbia	Nebraska	Vermont
Florida	Nevada	Virginia
Georgia	New Hampshire	Washington
Idaho	New Jersey	West Virginia
Illinois	New Mexico	Wisconsin
Indiana	New York	Wyoming
Iowa	North Carolina	Alaska
Kansas	North Dakota	Canal Zone
Kentucky	Ohio	Hawaii
Louisiana	Oklahoma	Puerto Rico
Maine	Oregon	Virgin Islands
Maryland	Pennsylvania	

One Year of College

California

TABLE 16.—*Medical Schools Requiring an Internship*

United States

College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Chicago Medical School
Northwestern University Medical School
University of Minnesota Medical School
Duke University School of Medicine *

Canada

University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Montreal Faculty of Medicine

* Degree not withheld until internship completed.

Graduates of Approved Schools and Others Registered, 1922-1949

The educational preparation of physicians registered for the practice of medicine from 1922 to 1949 inclusive is shown in table 26. In the computation of these figures, schools rated as class A and B prior to 1928 by the Council on Medical Education and Hospitals of the American Medical Association are classified as

TABLE 17.—*Medical Licensing Boards Requiring a One Year Internship* *

Alabama	New Hampshire	Washington [1]
Arizona	New Jersey [1]	West Virginia
Delaware [1]	North Dakota	Wisconsin
District of Columbia	Oklahoma [1]	Wyoming
Idaho [2]	Oregon	Alaska
Illinois [1]	Pennsylvania [1]	Canal Zone [1]
Iowa [1]	Rhode Island [1]	Hawaii [1]
Michigan [1]	South Dakota	Puerto Rico [1]
Montana	Utah [1]	Virgin Islands
Nevada	Vermont [1]	

* Some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.
1. Internship must be a rotating service.
2. Internship must be a straight service.

TABLE 18.—*Licensure Requirements for Interns and Residents in Hospitals*

	Licensure in State Required for	
	Interns	Residents
Alabama	No	No
Arizona	No	No
Arkansas	No	Yes
California	No [1]	Yes [2]
Colorado	No	No
Connecticut	No [3]	No [3]
Delaware	No	No
District of Columbia	No	Yes
Florida	No	Yes
Georgia	Yes	Yes
Idaho	No	No
Illinois	No	Yes
Indiana	No	Yes
Iowa	No	Yes
Kansas	No	Yes
Kentucky	No	No
Louisiana	No	Yes
Maine	No	Yes
Maryland	No	No [3]
Massachusetts	Yes	Yes
Michigan	No	Yes
Minnesota	No	Yes
Mississippi	No	Yes
Missouri	No	No
Montana	No	Yes
Nebraska	No	No
Nevada	Yes	Yes
New Hampshire	No	No
New Jersey	No [4]	No [4]
New Mexico	No	Yes
New York	No	No
North Carolina	No	Yes
North Dakota	No	Yes
Ohio	No	Yes
Oklahoma	No	Yes
Oregon	No	No
Pennsylvania	No	Yes
Rhode Island	No	No
South Carolina	No	Yes
South Dakota	No	No
Tennessee	No	No
Texas	No	Yes
Utah	No	No
Vermont	No	No
Virginia	No [5]	No [5]
Washington	No	Yes
West Virginia	No	No
Wisconsin	No	Yes
Wyoming	No	No
Alaska	No	No
Canal Zone	No	No
Hawaii	No	No
Puerto Rico	Yes	Yes
Virgin Islands	No	No

1. Physician registered with state board may serve as an intern not to exceed two years without licensure.
2. May commence residency before licensure.
3. Required by some hospitals.
4. May have service of two years without licensure.
5. May have service of three years without licensure.

approved. In the colum. headed "Others" are included persons who graduated prior to 1907, when the first classification of medical schools was made by the Council, graduates of class C schools, graduates of foreign faculties of medicine, osteopaths given recognition by medical licensing boards, and graduates of medical schools since 1907 which have not been approved by the Council. In 1928 the classification of medical schools in categories of A, B and C by the Council was discontinued. Since that date schools have been classified simply as approved or unapproved.

registered in 23 states, Alaska and Hawaii during the last six years. Figures are reported separately in table 28 for those licensed after written examination and those licensed by reciprocity or endorsement of credentials. The number annually registered in these 23 states are listed for the six year period from 1944 to 1949 inclusive. In the six years shown, 1,149 graduates of unapproved schools were registered, 1,120 by examination and 20 by endorsement. In 1949, there were 191 licensed in 15 states, 184 by examination and 7 by reciprocity.

TABLE 19.—*Professional Educational Requirements by Medical Licensing Boards*

	Length of Medical School Academic Year						Total Time Spent in Medical School (Registration to Graduation)						
	Hours	Weeks	Months	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.*	Not Specified by Board	Hours	Weeks	Months	Years	M.D. Degree	Same as Approved Medical Schools	Same as A.A M.C. and C.M.E. and H.*
Alabama	..	..	9	..	..	..	..	..	..	..	X	..	..
Arizona	..	..	..	..	X	..	..	..	..	..	..	..	X
Arkansas	..	..	9	..	..	..	..	..	..	4	..	..	..
California	..	32	..	..	..	..	4,000	..	..	4	..	..	..
Colorado	..	..	..	..	..	X	..	..	..	..	X	..	..
Connecticut	..	32	..	..	..	..	..	..	..	4	..	..	..
Delaware	..	..	7	..	..	..	..	..	28	..	X	..	..
District of Columbia	..	..	9	..	..	..	..	..	..	4	..	..	..
Florida	..	..	9	..	..	..	..	..	..	4	..	..	..
Georgia	..	..	9	..	..	..	..	..	..	4	..	..	..
Idaho	..	..	9	..	..	..	..	..	..	4	..	..	..
Illinois	..	..	9	..	..	..	..	..	36	..	..	..	..
Indiana	..	..	8	..	..	..	..	..	42	..	..	..	..
Iowa	..	..	9	..	..	..	..	..	..	4	..	..	..
Kansas	..	..	..	..	..	X	..	..	..	4	..	..	..
Kentucky	..	..	8½	..	..	..	..	..	..	4	..	..	..
Louisiana	..	..	..	..	X	..	..	..	..	..	X	..	X
Maine	..	32-34	..	..	..	..	..	..	..	4	..	..	..
Maryland	..	..	..	..	X	..	..	..	..	4	..	X	..
Massachusetts	..	32	..	..	..	..	..	..	..	..	X	..	..
Michigan	..	32	..	..	..	..	..	..	36	..	..	..	..
Minnesota	..	36	..	..	..	..	..	..	..	4	..	..	..
Mississippi	..	32	..	..	..	..	..	..	..	4	..	..	..
Missouri	..	32	..	..	..	..	..	..	..	4	..	..	..
Montana	..	..	9	..	..	..	..	..	..	4	..	..	..
Nebraska	..	..	9	..	..	..	..	..	36	..	..	..	..
Nevada	..	..	9	..	..	..	..	..	..	4	..	..	..
New Hampshire	..	..	..	..	..	X	..	..	..	..	X	..	..
New Jersey	..	..	8	..	..	..	..	..	..	4	..	..	..
New Mexico	..	..	..	X	..	..	..	..	..	..	X	X	..
New York	..	..	8	..	..	..	..	..	..	4	..	..	..
North Carolina	..	..	9	..	..	..	..	..	..	4	..	..	..
North Dakota	..	..	9	..	..	..	..	..	..	4	..	..	..
Ohio	..	..	9	..	..	..	..	..	..	4	..	..	..
Oklahoma	..	..	..	X	..	..	..	..	..	..	X	..	..
Oregon	..	..	8	..	..	..	..	..	..	4	..	..	..
Pennsylvania	..	32	..	..	..	..	..	..	..	4	..	..	..
Rhode Island	..	..	..	..	X	..	..	..	..	..	X	..	..
South Carolina	..	36	..	..	..	..	..	104	..	..	..	..	..
South Dakota	..	..	..	..	..	X	..	..	..	4	..	..	..
Tennessee	..	..	9	..	..	..	..	..	36	..	..	..	..
Texas	..	..	8	..	..	..	..	..	..	4	..	..	..
Utah	..	..	9	..	..	..	..	..	..	4	..	..	..
Vermont	900	..	..	..	..	..	..	..	..	4	..	..	..
Virginia	..	32	8	..	..	..	..	..	..	4	..	..	..
Washington	..	..	9	..	..	..	..	..	..	4	..	..	..
West Virginia	..	..	..	..	..	X	..	..	..	..	X	..	..
Wisconsin	..	..	..	..	..	X	..	..	..	4	..	..	..
Wyoming	..	..	9	..	..	..	..	..	..	4	..	..	..
Alaska	..	..	..	..	X	..	..	..	..	..	..	..	X
Canal Zone	..	..	10	..	..	..	..	..	..	4	X	..	..
Hawaii	..	..	..	..	X	..	..	..	..	..	..	..	X
Puerto Rico	..	..	..	..	X	..	..	..	..	..	..	..	X
Virgin Islands	..	..	..	..	..	X	..	..	..	..	X	..	X

* Association of American Medical Colleges and Council on Medical Education and Hospitals of the American Medical Association.
X Implies requirements are those of the two accrediting agencies.

In the 28 year period 223,196 of the physicians registered, or 89.7 per cent of the total, were graduates of approved schools and 25,582, or 10.3 per cent, were graduates of other schools. In 1949, there were 12,148 candidates registered, of whom 11,378 (93.7 per cent) represented graduates of approved medical schools and 770 (6.3 per cent) were in the second group.

Graduates of Unapproved Schools Registered, 1944-1949

Graduates of institutions which are classified by the Council on Medical Education and Hospitals of the American Medical Association as unapproved were

Illinois, which accepts for licensure the graduates of one school which was not approved by the Council until 1948, New York and Florida which have made certain concessions, and Massachusetts licensed the largest number of graduates of unapproved medical schools.

Graduates of Schools of Osteopathy Registered By Examining Boards, 1944-1949

The number of graduates of schools of osteopathy granted the privilege of practicing medicine or surgery or both by 17 medical examining boards for six years (1944-1949) are given in table 29. There have been 1,122 such individuals registered, 814 by examination

and 308 without written examination. In 1949 there were 98 so registered in 14 states, 66 by examination and 32 by reciprocity.

Following is a summary of the situation in the 16 states and the District of Columbia providing for the licensing of osteopaths by the medical examining board.

In 1947, Alabama registered a graduate of a school of mechanotherapy.

In Colorado an osteopath receives a license to practice medicine. In Connecticut any registered osteopath may practice either medicine or surgery or both, according to the type of examination taken, if he passes a satisfactory examination before the medical examining board. In Delaware osteopaths are licensed as "osteopathic physicians." In the District of Columbia osteopaths are granted the right to practice surgery. In Indiana the licenses issued to osteopaths under a 1945 amendment to the medical practice act authorize the holders to practice medicine and surgery. Licentiates in osteopathy prior to 1945 have now been authorized to practice osteopathy, surgery and obstetrics. In Massachusetts the medical practice act, by definition includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic applicant. According to a law passed in Nebraska in 1943, "any person now licensed to practice osteopathy may, if application was made prior to July 1, 1948 and on payment of the prescribed fee, take the first regular examination given after the application is made before the Board of Examiners in Medicine. . . . If successful, he or she shall receive a license to practice

TABLE 20.—*Schedule of Written Examination Dates and Issuance of Licenses by Reciprocity or Endorsement of Credentials*

	Written Examination	Licenses by Reciprocity or Endorsement Issued
Alabama	Once annually	Continuously
Arizona	Quarterly	Quarterly
Arkansas	Semi-annually	Continuously
California	Quarterly	Six meetings annually
Colorado	Semi-annually	Quarterly
Connecticut	March, July and Nov.	Continuously
Delaware	January and July	January and July
District of Columbia	Semi-annually	Quarterly
Florida	June and Nov.	None
Georgia	June and Oct.	Quarterly
Idaho	Jan. and July	Jan. and July
Illinois	Quarterly	Quarterly
Indiana	Annually—June	Six meetings annually
Iowa	June and Dec.	Every 2 months
Kansas	Semi-annually	Semi-annually
Kentucky	Semi-annually	Continuously
Louisiana	June and Dec.	June and Dec.
Maine	March, July and Nov.	March, July and Nov.
Maryland	June and Dec.	Every 5 weeks
Massachusetts	Jan. and July	Every month
Michigan	June and Oct.	Continuously
Minnesota	Quarterly	Quarterly
Mississippi	June	June and Dec.
Missouri	Three times annually	Six times annually
Montana	Semi-annually	Semi-annually
Nebraska	Once annually	Continuously
Nevada	Semi-annually	Semi-annually
New Hampshire	March and Dec.	March and Dec.
New Jersey	June and Oct.	Monthly
New Mexico	Semi-annually	Semi-annually
New York	Three times annually	Continuously
North Carolina	June	Five times annually
North Dakota	Jan. and July	Jan. and July
Ohio	June and Dec.	Quarterly
Oklahoma	Once annually	Quarterly
Oregon	Jan. and July	Quarterly
Pennsylvania	Jan. and July	Monthly
Rhode Island	Quarterly	Quarterly
South Carolina	Semi-annually	Monthly
South Dakota	Semi-annually	Semi-annually
Tennessee	Every 3 months	Quarterly
Texas	June and Nov.	June and Nov.
Utah	Once annually—July	Semi-annually
Vermont	Semi-annually	Continuously
Virginia	Semi-annually	Semi-annually
Washington	Semi-annually	Semi-annually
West Virginia	Quarterly	Quarterly
Wisconsin	Twice annually	Twice annually
Wyoming	Quarterly	Quarterly
Alaska	March and Sept.	Continuously
Canal Zone	As needed	As needed
Hawaii	Jan. and July	Monthly
Puerto Rico	Semi-annually	Quarterly
Virgin Islands	Twice annually	Twice annually

TABLE 21.—*Temporary Permits, 1949*

State	Permit Valid for:	Permits Granted
Arizona	Next board meeting	...
Delaware	Four months	2
Georgia	Next board meeting	...
Idaho	Six months	9
Indiana [1]	Six months	137
Kansas	Next board meeting	78
Kentucky	1-5 years (limited license)	...
Louisiana	Next board meeting	101
Maine [3]	Ten weeks	20
Mississippi	Next board meeting	78
Nebraska [1]	Until licensure is perfected	8
New Hampshire	Varies	...
New Jersey	Four months	9
New Mexico	Six months	47
Oklahoma	One year	4
Virginia	Next board meeting	57
West Virginia	Next board meeting	*
Alaska	Six months	19
Puerto Rico [2]	Until 1951	45
Virgin Islands [2]	Until next examination	1
Total		615

1. Reciprocity applicants.
2. Government positions only.
3. Summer camp physicians.
* No numerical record.

TABLE 22.—*Medical Licensure Fees*

	Examination	Reciprocity or Endorsement
Alabama	$ 10	$ 50
Arizona	25	100
Arkansas	25	50-100
California	25	100
Colorado	50 [1]	50
Connecticut	25	50 [2]
Delaware	25	100
District of Columbia	25	50
Florida	25	...
Georgia	20	50
Idaho	25	100
Illinois	15	25
Indiana	25	50
Iowa	25	50
Kansas	25	... [3]
Kentucky	25	50
Louisiana	25	50 [4]
Maine	25	50
Maryland	20	50
Massachusetts	25	50
Michigan	10	50
Minnesota	20	75
Mississippi	10	50
Missouri	15	50
Montana	50	75
Nebraska	25	50
Nevada	100	200
New Hampshire	20	20
New Jersey	25	100
New Mexico	50	50
New York	25	25
North Carolina	15	50
North Dakota	25	50
Ohio	25	50
Oklahoma	25	100
Oregon	25	100
Pennsylvania	25	50
Rhode Island	20	20
South Carolina	25	50
South Dakota	20	50
Tennessee	25	50
Texas	15	25
Utah	25	50
Vermont	20	50
Virginia	25	50
Washington	25	25
West Virginia	25	100
Wisconsin	25	50 [4]
Wyoming	* 25	50
Alaska	25	100
Hawaii	25	25
Puerto Rico	30	30
Virgin Islands	65	50

1. For graduates within last five years $25.
2. Endorsement of certificate of National Board of Medical Examiners $25.
3. Same as charged by the reciprocating state.
4. Same as charged by the reciprocating state if more than $50.

medicine and surgery in the state." In New Hampshire osteopaths are granted the right to practice medicine and surgery.

New Jersey provides that osteopaths licensed prior to Nov. 1, 1941 who furnish proof prior to that date of having served for a period of two years as an intern or resident surgeon in an osteopathic or medical hospital approved by the board of medical examiners, of having completed a postgraduate course of two years in a college of osteopathy or medicine approved by the board or of having had at least three years of practice in a hospital approved by the board can be admitted to an examination in pharmacology, therapeutics and surgery and, if successful, can obtain a license to practice medicine and surgery. Since 1941 all osteopathic applicants who have met the requirements of the medical practice act have been licensed to practice medicine and surgery.

In New York a law approved April 10, 1946 provides that any osteopathic licentiate who had obtained the additional right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics and biologic products or any applicant who has met or shall meet all the preliminary and professional requirements as required as of September 1, 1936 and has satisfactorily passed or shall satisfactorily pass the regular medical licensing examination shall be granted the right to practice medicine without limitation as defined by the statutes of the State of New York.

A law passed in Ohio in 1943 gives osteopaths who obtain their licenses under that act the right to practice osteopathic medicine and surgery. In Oregon they are granted the right to practice "in the subjects" covered by the examination, which includes surgery. The medical practice act of Texas provides for the issuing of a license to practice medicine only, and osteopaths are issued licenses unrestricted in scope. In Virginia osteopaths may obtain the right to use drugs and perform surgery with the use of instruments if they satisfy the board of medical examiners that they are qualified to do so. Wisconsin grants osteopaths the privilege of practicing surgery, and in Wyoming the statutes contain no specific provision for the licensing of osteopaths.

TABLE 23.—*States Requiring Annual Registration*

	Fee		Fee		Fee
Arizona	$ 3	Louisiana	$ 2	Pennsylvania	$ 1
Arkansas	[a]	Minnesota	2	Tennessee	5
California	2	Missouri *	1	Texas	2
Colorado	[b]	Montana	[d]	Utah	3
Connecticut	2	Nebraska	1	Virginia	1
Dist. of Columbia	2	Nevada	2	Washington	5
Georgia	None	New Mexico	[f]	West Virginia *	2
Idaho	10	New York *	4	Wisconsin	3
Indiana	[c]	North Dakota	[e]	Wyoming	2.50
Iowa	1	Oklahoma	3	Alaska	10
Kansas	1	Oregon	10	Hawaii	2

a. Residents $2, Nonresidents $4.
b. Residents $2, Nonresidents $10.
c. Residents $5, Nonresidents $10.
d. Residents $5, Nonresidents $1.
e. Residents $5, Nonresidents $2.
f. Residents $2, Nonresidents $5.
* Biennial registration.

TABLE 24.—*Candidates Examined, 1945-1949*

	1945		1946		1947		1948		1949		Totals for Five Years		
	P	F	P	F	P	F	P	F	P	F	P	F	%F
Alabama	23	0	20	0	97	0	16	2	46	1	202	3	1.5
Arizona	11	0	12	1	19	3	17	0	22	0	81	4	4.7
Arkansas	65	0	63	0	54	0	59	0	52	0	293	0	0.0
California	467	11	530	11	503	10	493	36	492	57	2,485	125	5.0
Colorado	66	0	77	0	95	0	72	2	78	0	388	2	0.5
Connecticut	31	12	55	10	49	17	32	7	29	15	196	61	23.7
Delaware	5	0	16	1	20	0	20	0	21	0	82	1	1.2
Dist. of Columbia	20	1	41	0	39	0	33	3	30	1	163	5	3.0
Florida	198	37	373	62	314	17	301	26	308	19	1,494	161	10.8
Georgia	124	0	168	2	129	0	131	1	109	4	661	7	1.0
Idaho	18	0	54	0	62	0	51	0	38	1	223	1	0.4
Illinois	415	31	751	33	685	16	512	44	367	67	2,650	191	6.7
Indiana	231	0	139	16	111	12	90	2	98	4	678	34	4.8
Iowa	68	1	57	4	55	0	67	0	57	0	304	5	1.6
Kansas	101	0	102	0	86	0	67	0	99	1	455	1	0.2
Kentucky	76	0	106	0	90	0	60	0	86	0	478	0	0.0
Louisiana	208	1	189	1	225	1	182	0	164	1	968	4	0.4
Maine	9	3	45	4	31	2	31	3	25	4	141	16	10.1
Maryland	193	8	204	4	175	6	185	8	172	17	929	43	4.4
Massachusetts	124	175	89	163	84	140	65	111	41	92	403	681	62.8
Michigan	194	0	215	0	176	0	181	0	164	0	870	0	0.0
Minnesota	217	0	313	0	248	0	212	1	184	0	1,174	1	0.1
Mississippi	50	0	45	0	39	0	47	0	35	5	236	5	2.1
Missouri	258	1	251	1	265	0	238	0	198	0	1,210	2	0.2
Montana	2	0	17	0	8	0	10	1	8	0	45	1	2.2
Nebraska	74	7	81	5	87	3	84	16	52	4	378	35	8.5
Nevada	1	1	15	3	8	0	3	1	4	1	31	6	16.2
New Hampshire	6	1	20	4	10	0	10	1	7	1	53	7	11.7
New Jersey	95	9	116	5	89	13	90	22	76	9	466	58	11.1
New Mexico	0	0	1	0	1	0	3	0	4	1	9	1	10.0
New York	287	247	427	386	610	482	426	371	411	397	2,161	1,883	46.6
North Carolina	132	1	95	0	113	1	112	0	88	0	540	2	0.4
North Dakota	4	0	13	0	25	0	30	0	24	0	96	0	0.0
Ohio	325	13	340	10	297	3	322	7	262	6	1,546	39	2.5
Oklahoma	69	0	68	0	72	0	59	0	47	1	315	1	0.3
Oregon	19	1	50	3	80	0	48	0	47	4	244	8	3.2
Pennsylvania	456	13	463	3	437	3	448	6	396	3	2,110	28	1.3
Rhode Island	6	0	40	0	32	0	21	0	15	1	114	1	0.9
South Carolina	58	0	53	0	55	0	57	0	43	1	265	1	0.4
South Dakota	6	0	10	0	18	0	27	0	10	0	71	0	0.0
Tennessee	193	2	157	1	148	0	150	0	177	0	825	3	0.4
Texas	228	7	265	14	282	13	262	33	184	10	1,222	77	5.9
Utah	13	0	79	0	0	0	18	0	30	0	140	0	0.0
Vermont	2	0	5	0	27	1	16	0	11	4	61	5	7.6
Virginia	39	2	174	2	130	4	136	4	109	5	588	17	2.8
Washington	35	0	130	0	116	0	110	0	72	0	463	0	0.0
West Virginia	20	0	64	0	40	0	55	0	61	0	240	0	0.0
Wisconsin	96	0	123	1	143	0	182	7	109	0	653	8	1.2
Wyoming	0	0	0	0	0	0	0	0	1	0	1	0	0.0
U. S. Territories and Possessions	35	2	74	4	55	3	54	5	56	7	274	21	7.0
Total Examined	5,930		7,610		7,164		6,624		5,963		33,291		
Passed	5,343		6,856		6,414		5,904		5,219		29,736		
Failed	587		754		750		720		744		3,555		
Percentage Failed	9.9		9.9		10.5		10.8		12.5		10.7		

TABLE 25.—*Registration of Physicians, 1904-1949*

Year	Examined	Passed	Percentage Failed	Reciprocity or Endorsement	Total Registered
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,904	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,754	4,085	14.0	1,360	5,445
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,002	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,886	7,133
1933	5,673	5,244	7.6	1,989	7,233
1934	6,145	5,628	8.4	2,161	7,789
1935	6,443	5,859	9.1	2,194	8,053
1936	6,918	6,224	10.0	2,773	8,997
1937	7,334	6,604	10.0	3,205	9,809
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,926	6,291	20.7	2,866	9,157
1941	7,539	6,057	19.7	2,762	8,819
1942	7,223	6,120	15.4	2,469	8,589
1943	8,403	7,489	10.9	2,340	9,829
1944	6,817	6,011	11.8	2,596	8,607
1945	5,930	5,343	9.9	3,622	8,965
1946	7,610	6,856	9.9	9,669	16,525
1947	7,164	6,414	10.5	7,701	14,115
1948	6,624	5,904	10.8	7,595	13,499
1949	5,963	5,219	12.5	6,929	12,148

The medical practice act of the latter state provides that the certificate issued to all applicants "shall be deemed licenses to practice medicine in all branches in which the applicant has taken examination in the state."

Licensure of Foreign-Trained Physicians

In 1947 the Council on Medical Education and Hospitals of the American Medical Association established an advisory committee on foreign medical credentials to assist it in studying the problem of physicians trained in foreign medical schools who desired to come to the United States and establish a medical practice. Eighteen organizations and governmental agencies in addition to the Council are represented on the committee. In 1949 [1] the committee recommended that the Council on Medical Education and Hospitals, in collaboration with the Association of American Medical Colleges, give immediate consideration to the feasibility of developing a limited listing of foreign medical schools. On the basis of published reports, personal reports from American physicians who have visited foreign medical schools in recent years and the records of the performance of the graduates of foreign schools in state licensing examinations during the past 10 years, a preliminary list of foreign schools was published in February 1950 by the Council on Medical Education and Hospitals and the Executive Council of the Association of American Medical Colleges.[2] In the preamble to this list, these two bodies state that they are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the medical schools listed on the same basis as graduates of approved medical schools in the United States. The present list is not final, and it will be supplemented as information is compiled for other schools. It was considered desirable to issue a preliminary list at this time rather than to wait until information could be compiled for all medical schools of the world, a process that will require years to complete. The medical faculties named on this initial list are as follows:

TABLE 26.—*Graduates of Approved Schools and Others Registered, 1922-1949*

Year	Graduates of Approved Schools		Others		Totals
	Number	Per Cent of Total	Number	Per Cent of Total	
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,676	92.1	457	6.3	7,133
1933	6,774	93.7	459	6.3	7,233
1934	7,172	92.1	617	7.9	7,789
1935	7,360	91.3	693	8.5	8,053
1936	7,934	88.1	1,063	11.8	8,997
1937	8,391	85.5	1,418	14.4	9,809
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,781	85.0	1,376	15.0	9,157
1941	7,770	87.9	1,049	11.9	8,819
1942	7,290	84.9	1,299	15.1	8,589
1943	8,640	87.9	1,189	12.2	9,829
1944	7,737	89.8	870	10.1	8,607
1945	8,233	91.8	732	8.1	8,965
1946	15,692	94.9	835	5.1	16,527
1947	13,097	93.0	1,018	7.0	14,115
1948	12,791	94.8	708	5.2	13,499
1949	11,378	93.7	770	6.3	12,148
Totals	223,196	89.7	25,582	10.3	248,778

Foreign Medical Schools

DENMARK

University of Copenhagen Faculty of Medicine (Kobenhavns Universitet Laegevidenskabelige Fakultet).

FINLAND

University of Helsinki Faculty of Medicine (Helsingfors Universitet Medicinska Fakulteten).

Medical Faculty Turku University (Turun Yliopiston Laaketieteellinen Tiedekunta).

NETHERLANDS

University of Amsterdam Faculty of Medicine (Universiteit van Amsterdam Geneeskunde Faculteit).

State University of Groningen Faculty of Medicine (Rijks-Universiteit te Groningen Medische Faculteit).

State University of Leiden Faculty of Medicine (Rijks-Universiteit te Leiden Faculteit der Geneeskunde).

State University of Utrecht Faculty of Medicine (Rijks-Universiteit te Utrecht Faculteit der Geneeskunde).

NORWAY

University of Oslo Faculty of Medicine (Kongelige Frederiks Universitet Medisinske Fakultet).

SWEDEN

Royal Charles University Medical Faculty, Lund (Kungl. Karolinska Universitetet Medicinska Fakulteten).

Charles Medico-Surgical Institute, Stockholm (Karolinska Mediko-Kirurgiska Institutet).

Royal University of Uppsala Medical Faculty (Kungl. Universitetet i Uppsala Medicinska Fakulteten).

United Kingdom*

ENGLAND

University of Birmingham Faculty of Medicine.
University of Bristol Faculty of Medicine.
University of Cambridge Faculty of Medicine.
University of Durham Medical School, Newcastle-upon-Tyne.
University of Leeds Faculty of Medicine.
University of Liverpool Faculty of Medicine.
University of London.**
University of Manchester Faculty of Medicine.
University of Oxford Faculty of Medicine.
University of Sheffield Faculty of Medicine.

NORTHERN IRELAND

Queen's University of Belfast Faculty of Medicine.

SCOTLAND

University of Aberdeen Faculty of Medicine.
University of Edinburgh Faculty of Medicine.
University of Glasgow Faculty of Medicine.
University of St. Andrews Medical School, St. Andrews and Dundee.

WALES

Welsh National School of Medicine, University of Wales, Cardiff.

1. J. A. M. A. **139**: 16 (April 16) 1949.
2. J. A. M. A. **142**: 571 (Feb. 25) 1950.

* The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who did not complete the work for the degree and who obtained their qualifications only through the examinations of the licensing corporations of the United Kingdom.

** Work for the medical degree of the University of London is offered at the following hospital medical schools:
Charing Cross Hospital Medical School.
Guy's Hospital Medical School.
King's College Hospital Medical School.
London Hospital Medical School.
Middlesex Hospital Medical School.
Royal Free Hospital School of Medicine.
St. Bartholomew's Hospital Medical College.
St. George's Hospital Medical School.
St. Mary's Hospital Medical School.
St. Thomas' Hospital Medical School.
University College Hospital Medical School.
Westminster Hospital Medical School.

TABLE 27.—*Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada*

	Admitted to Examination	Admitted by Endorsement of State License *	Citizenship	Basic Science Certificate	Internship in Hospital in United States	Further Medical Training	Examination Fee, Dollars	Footnotes
Alabama	x	..	x	..	x	..	10	1
Arizona	Not accepted							
Arkansas	Not accepted							
California	x	x	x	..	x	x	25	2
Colorado	x	..	1st P	x	x	x	50	7,8,25
Connecticut	x	x	1st P	x	..	..	25	3,28
Delaware	x	..	x	..	x	..	25	4,24
District of Columbia	x	x	..	x	x	..	25	5,28
Florida	x	..	x	x	..	x	25	6
Georgia	Not accepted							
Idaho	Not accepted							
Illinois	x	..	1st P	..	x	..	15	..
Indiana	x	x	..	..	..	x	25	7,8
Iowa	x	..	x	x	x	x	25	8
Kansas	x	..	x	..	x	..	25	9
Kentucky	Not accepted							
Louisiana	Not accepted							
Maine	Not accepted							
Maryland	x	..	1st P	..	x	..	20	11,26
Massachusetts	x	..	1st P	..	..	..	25	..
Michigan	x	..	..	x	x	x	10	7
Minnesota	x	..	x	x	..	..	20	12
Mississippi	x	..	x	..	x	..	10	13,24
Missouri	x	..	x	..	x	..	15	12
Montana	Not accepted							
Nebraska	x	..	x	x	..	..	25	22,28
Nevada	Not accepted							
New Hampshire	x	x	x	..	x	..	20	14,26
New Jersey	x	x	x	..	x	..	25	15
New Mexico	x	..	1st P	x	..	..	50	27
New York	x	x	1st P	..	..	..	25	16
North Carolina	Not accepted							
North Dakota	x	..	x	..	x	x	25	17
Ohio	x	x	x	..	..	..	25	17,18,28
Oklahoma	Not accepted							
Oregon	x	..	x	x	x	..	25	24
Pennsylvania	x	..	1st P	..	x	..	25	19,28
Rhode Island	x	..	1st P	x	x	x	20	20
South Carolina	Not accepted							
South Dakota	x	..	1st P	x	x	..	20	..
Tennessee	x	..	x	x	..	..	25	24
Texas	x	..	x	..	x	..	15	21
Utah	Not accepted							
Vermont	Not accepted [14]							
Virginia	x	..	1st P [23]	..	..	..	25	12
Washington	x	..	..	x	x	..	25	24
West Virginia	Not accepted							
Wisconsin	x	..	1st P	x	..	..	25	11,24
Wyoming	Not accepted							
Alaska	x	x	x	x	x	..	25	..
Hawaii	x	..	x	..	x	..	25	14
Puerto Rico	x	x	x	..	x	..	30	..
Virgin Islands	Not accepted							

This summary should be supplemented by direct communication with the secretary of the licensing board of the state in which the physician is interested.

x. Implies yes.

* Refer to chart "Reciprocity and Endorsement Policies" for further data.

1. Certificate of National Board of Medical Examiners required.

2. (a) Citizenship waived if country in which applicant is licensed will admit to licensure citizens of the United States. (b) Acceptable for reciprocal registration if license submitted was granted on same standards as in effect in California on the same date and upon completion of an oral, clinical and written examination. (c) Internship in United States satisfactory to the board or completion of senior year in approved medical school in the United States.

3. Effective July 1, 1948, physicians who have graduated from medical schools located outside of the United States, Canada or the British Isles subsequent to Jan. 1, 1940 not eligible.

4. Residence of one year in Delaware required.

5. (a) Acceptable for reciprocal registration if similar privileges are accorded licentiates of District of Columbia by licensing agency or jurisdiction from which applicant comes. (b) Regulations cited refer also to graduates of Canadian schools.

6. Senior year in an approved medical school in the United States or Canada, possess the degree of Master of Public Health from an acceptable school, or satisfactorily complete a one year's assistant residency, residency or fellowship in an approved hospital in the United States accepted as further training.

7. Further training—Completion of senior year in approved medical school in the United States.

8. Further training—Internship or one year in medical school in the United States.

9. (a) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States. (b) In lieu of internship, certificate from three graduates of the applicant's medical school licensed to practice medicine in United States accepted.

10. (a) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States. (b) No applications accepted from countries other than England (certain schools), Ireland, Scotland and Australia.

11. Fee of $5.00 charged for evaluation of credentials.

12. Applicants considered individually.

13. Evidence must show school of graduation was acceptable at time of issuance of diploma.

14. Diplomates of National Board of Medical Examiners eligible on reciprocity basis.

15. (a) Internship completed in foreign countries after July 1, 1934 not acceptable. (b) Graduates of medical schools of Europe and Asia prior to Nov. 19, 1941 not accepted. (c) Graduates of medical schools of South American Republics, Mexico and Cuba not accepted.

16. Graduates of continental European medical schools after 1942 required to complete two years of approved internship. Graduates of medical schools in Mexico and Latin and South America required to complete two years of approved internship or postgraduate medical study.

17. License to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States.

18. Graduates of schools in Continental Europe after 1943 not eligible.

19. Medical education completed in foreign medical schools since 1941 not acceptable.

20. (a) Matriculants in foreign medical faculties subsequent to Jan. 1, 1949 not acceptable. (b) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located.

21. European graduates after 1939 limited to English speaking schools.

22. Internship of one year in an approved hospital in the United States after acquiring full citizenship required. If application is accepted, the board has established basic recommendations which must be met prior to citizenship.

23. This requirement may be waived.

24. Recognition limited to graduates of schools listed by Council on Medical Education and Hospitals of the American Medical Association and Executive Council of Association of American Medical Colleges.

25. Graduates of certain medical schools of Europe prior to the year 1940 acceptable at the discretion of the board.

26. Graduates of foreign medical schools are considered individually. Graduates of medical schools in Europe who obtained the medical degree after Jan. 1, 1940 are not eligible unless they have graduated from one of the schools listed by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges, or have done some special work in an approved medical school in the United States or a recognized hospital. Graduates of Latin American medical schools are not accepted unless they have done outstanding work in medical schools or hospitals in the United States.

27. Graduates of foreign medical schools not included on list issued by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges may be accepted if they possess either a certificate of the National Board of Medical Examiners or the certificate of one of the American boards in the specialties.

28. List of foreign medical schools prepared by Council on Medical Education and Hospitals of the American Medical Association and Executive Council of the Association of American Medical Colleges accepted.

The position of the Council and the Executive Council with respect to schools not on this list is that they neither approve nor disapprove these schools but must leave to individual institutions and organizations in the United States the decision whether they will accept graduates of these schools on the same basis that they accept graduates of approved medical schools in the United States.

Fourteen state licensing boards have already reported they will use the list as a guide in the evaluation of credentials of foreign-trained physicians. Fifteen states reported that their boards have not met since the list was released but that the list will be given consideration. The acceptance of this list by licensing boards does not imply, except in a few instances, that graduates of other schools will be refused licensure. Most boards have stated that graduates of other schools will be considered on an individual basis.

The present requirements for candidates seeking medical licensure in the United States, Alaska, Hawaii,

Puerto Rico and the Virgin Islands on the basis of credentials obtained in countries other than the United States and Canada are given in table 27. Thirty-six boards will admit foreign physicians to the licensing examination under varying conditions. Six states, Colorado, New Mexico, Oregon, South Dakota, Washington and Wisconsin, which heretofore did not license foreign physicians have modified their regulations and will now accept applications for licensure. Maine, however, has reported that foreign-trained physicians are no longer eligible for licensure. Graduates of foreign medical schools are not at present accepted for licensure by seventeen boards. Five of these states have reported that the list of foreign schools will be considered by their licensing boards at their next meeting. Four boards do not require citizenship, while 20 states require full citizenship. Twelve states require that the applicant file first citizenship papers only. Eight states had this requirement in 1949.

From a review of table 27 it would appear that the opportunities for the licensure of foreign-trained physicians is being given serious consideration by the authorities in the various states. While an attempt has been made to present the situation as it exists, it should be borne in mind that this table is intended to present

TABLE 28.—*Graduates of Unapproved Medical Schools Registered, 1944-1949*

	Examination						Reciprocity and Endorsement						Totals
	1944	1945	1946	1947	1948	1949	1944	1945	1946	1947	1948	1949	
Arizona	0	0	0	0	0	0	0	0	2	0	1	1	4
California	0	0	0	0	0	0	0	4	0	0	0	0	4
Florida	0	0	1	11	25	25	0	0	0	0	0	0	62
Georgia	0	0	0	0	0	1	0	0	0	0	0	3	4
Illinois	45	115	45	54	56	41	0	0	1	0	1	0	358
Iowa	0	0	1	0	0	0	0	0	1	0	0	0	2
Kentucky	0	0	0	2	0	2	0	0	0	0	0	0	4
Maine	0	0	0	0	0	0	0	0	0	0	0	2	2
Massachusetts	102	38	24	37	26	11	0	0	0	0	0	0	238
Mississippi	1	0	4	0	3	0	0	0	0	0	0	0	8
Missouri	0	0	0	0	0	0	1	1	0	0	0	0	2
Nebraska	0	0	0	0	0	0	0	0	1	0	1	0	2
Nevada	0	0	0	0	0	0	1	2	0	0	0	0	3
New Hampshire	0	0	0	1	0	0	0	1	0	0	0	0	2
New Mexico	0	0	0	1	0	0	0	1	0	0	0	0	2
New York	0	0	111	132	60	94	0	0	0	0	0	0	397
Ohio	0	0	6	4	1	1	0	0	0	0	0	0	12
Tennessee	0	0	0	0	0	0	0	0	0	0	0	1	1
Texas	0	0	0	0	0	0	0	0	1	0	0	0	1
Virginia	5	3	10	4	1	3	0	0	1	0	0	0	27
Washington	0	0	2	4	1	1	0	0	0	0	0	0	8
West Virginia	0	0	0	0	0	2	0	0	0	0	0	0	2
Wisconsin	0	0	0	0	0	0	0	1	0	0	0	0	1
Alaska	0	0	0	0	0	1	0	0	0	0	0	0	1
Hawaii	0	0	0	0	0	2	0	0	0	0	0	0	2
Totals	153	156	204	250	173	184	2	10	7	0	3	7	1,149

TABLE 29.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1944-1949*

	Examination						Reciprocity and Endorsement						Totals
	1944	1945	1946	1947	1948	1949	1944	1945	1946	1947	1948	1949	
Alabama	0	0	0	1	0	0	0	0	0	0	0	0	1
Colorado	7	7	5	11	5	5	0	0	0	0	0	0	40
Connecticut	5	2	5	3	0	1	0	0	0	0	0	0	16
Delaware	3	0	0	0	0	0	0	0	4	0	0	1	8
Dist. of Columbia	0	0	0	0	0	0	0	1	1	1	2	1	6
Indiana	3	0	43	0	0	3	3	7	7	0	0	1	67
Massachusetts	4	5	0	2	2	0	0	0	2	1	5	3	24
Nebraska	0	2	0	1	0	1	0	0	0	0	0	0	4
New Hampshire	3	0	0	0	0	0	2	0	0	3	6	4	18
New Jersey	30	15	9	9	3	5	0	0	0	2	3	1	77
New York	0	0	5	134	34	11	0	0	0	75	13	2	274
Ohio	72	48	47	12	21	24	3	1	7	10	12	4	261
Oregon	0	0	0	0	1	0	8	14	12	16	8	5	64
Texas	38	29	42	38	33	15	1	1	0	0	1	9	207
Virginia	0	0	1	0	1	0	0	0	0	0	1	0	3
Wisconsin	0	1	1	3	2	1	5	15	11	3	6	1	49
Wyoming	0	0	0	0	0	0	2	0	1	0	0	0	3
Totals	165	109	158	214	102	66	24	39	45	111	57	32	1,122

OFFICERS OF STATE BOARDS OF MEDICAL EXAMINERS

Alabama	Dr. D. G. Gill, 519 Dexter Ave., Montgomery 4.
Arizona	Dr. J. H. Patterson, 234 N. Central Ave., Phoenix.
Arkansas	Dr. Joe Verser, Harrisburg.
California	Dr. Frederick N. Scatena, 1020 N. Street, Sacramento 14.
Colorado	Dr. George H. Gillen, 831 Republic Bldg., Denver 2.
Connecticut	Dr. Creighton Barker, 160 St. Ronan St., New Haven.
Delaware	Dr. J. S. McDaniel, 229 S. State Street, Dover.
District of Columbia	Dr. G. C. Ruhland, 4130 E. Municipal Building, Washington.
Florida	Dr. Frank D. Gray, 12 N. Rosalind Avenue, Orlando.
Georgia	Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.
Idaho	Mr. Armand L. Bird, 305 Sun Bldg., Boise.
Illinois	Mr. Charles F. Kervin, Capitol Bldg., Springfield.
Indiana	Dr. Paul R. Tindall, 1138 K of P Building, Indianapolis 4.
Iowa	Dr. Walter L. Bierring, 1027 Des Moines Ave., Des Moines.
Kansas	* Dr. J. F. Hassig, 905 N. Seventh Street, Kansas City 10.
Kentucky	Dr. Bruce Underwood, 620 S. Third Street, Louisville 2.
Louisiana	Dr. R. B. Harrison, 1507 Hibernia Bank Building, New Orleans.
Maine	Dr. A. P. Leighton, 192 State Street, Portland.
Maryland	Dr. Lewis P. Gundry, 1215 Cathedral Street, Baltimore 1.
Massachusetts	Dr. George L. Schadt, Room 37, State House, Boston 33.
Michigan	Dr. J. E. McIntyre, 100 W. Allegan Street, Lansing 8.
Minnesota	Dr. J. F. DuBois, 230 Lowry Medical Arts Building, St. Paul 2.
Mississippi	Dr. Felix J. Underwood, Jackson 113.
Missouri	Mr. John A. Hailey, State Capitol Building, Jefferson City.
Montana	Dr. Sidney A. Cooney, 7 W. 6th Ave., Helena.
Nebraska	Mr. Oscar F. Humble, Room 1009, State Capitol Building, Lincoln.
Nevada	Dr. G. H. Ross, 112 N. Curry Street, Carson City.
New Hampshire	Dr. John S. Wheeler, 107 State House, Concord.
New Jersey	Dr. E. S. Hallinger, 28 West State St., Trenton.
New Mexico	Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.
New York	Dr. J. L. Lochner, 23 S. Pearl Street, Albany.
North Carolina	Dr. Ivan Procter, 226 Hillsboro Street, Raleigh.
North Dakota	Dr. C. J. Glaspel, Grafton.
Ohio	Dr. H. M. Platter, 21 West Broad Street, Columbus.
Oklahoma	Dr. F. C. Gallaher, 813 Braniff Building, Oklahoma City.
Oregon	Mr. Howard I. Bobbit, 608 Failing Building, Portland 4.
Pennsylvania	Mrs. M. G. Steiner, 351 Education Building, Harrisburg.
Rhode Island	Mr. Thomas B. Casey, 366 State Office Building, Providence.
South Carolina	Dr. N. B. Heyward, 1329 Blanding Street, Columbia.
South Dakota	Dr. Clarence E. Sherwood, 300 First National Bank Bldg., Sioux Falls.
Tennessee	Dr. H. W. Qualls, 1635 Exchange Building, Memphis 3.
Texas	Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth.
Utah	Mr. Frank E. Lees, 324 State Capitol Building, Salt Lake City.
Vermont	Dr. F. J. Lawliss, Richford.
Virginia	Dr. K. D. Graves, 631 First St., S.W., Roanoke.
Washington	Mr. J. D. McDougall, Olympia.
West Virginia	Dr. N. H. Dyer, State Capitol, Charleston 5.
Wisconsin	Dr. C. A. Dawson, Tremont Bldg., River Falls.
Wyoming	Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.
Alaska	Dr. W. M. Whitehead, Box 140, Juneau.
Canal Zone	Dr. S. D. Avery, Balboa Heights.
Hawaii	Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.
Puerto Rico	Mr. Luis Cueto Coll, Box 3717, Santurce.
Virgin Islands	Dr. Christian R. Moorehead, Charlotte Amalie.

* Deceased.

TABLE 30.—*Foreign-Trained Physicians Examined for Medical Licensure in the United States, 1949*

| | SCHOOL | 1 California P | F | 2 Colorado P | F | 3 Connecticut P | F | 4 Dist. of Columbia P | F | 5 Florida P | F | 6 Illinois P | F | 7 Kansas P | F | 8 Maine P | F | 9 Maryland P | F | 10 Massachusetts P | F | 11 Minnesota P | F | 12 Mississippi P | F | 13 Missouri P | F | 14 New Hampshire P | F | 15 New Jersey P | F | 16 New Mexico P | F | 17 New York P | F | 18 North Dakota P | F | 19 Ohio P | F | 20 Oklahoma P | F | 21 Pennsylvania P | F | 22 Rhode Island P | F | 23 Tennessee P | F | 24 Texas P | F | 25 Virginia P | F | 26 Washington P | F | 27 Alaska, Hawaii and Puerto Rico P | F | Totals | Examined—Passed | Examined—Failed | Percentage—Failed | Number of Boards Examined by | Marginal Number |
|---|---|---

| | | |

TABLE 30.—*Foreign Trained Physicians Examined for Medical Licensure in the United States, 1949—Continued*

| | SCHOOL | California | | Colorado | | Connecticut | | Dist. of Columbia | | Florida | | Illinois | | Kansas | | Maine | | Maryland | | Massachusetts | | Minnesota | | Mississippi | | Missouri | | New Hampshire | | New Jersey | | New Mexico | | New York | | North Dakota | | Ohio | | Oklahoma | | Pennsylvania | | Rhode Island | | Tennessee | | Texas | | Virginia | | Washington | | Alaska, Hawaii and Puerto Rico | | Totals | Examined—Passed | Examined—Failed | Percentage—Failed | Number of Boards Examined by | Marginal Number |
|---|---|---

a summary of existing requirements and that the licensure of all physicians is one of the "State's Rights" and physicians are urged to supplement the information contained in this table by direct communication with the licensing boards. It should further be understood that each application is considered individually by the boards, so that this summary does not absolutely guarantee licensure in those states who have indicated foreign-trained physicians are eligible for licensure.

Table 30 records the number of graduates of faculties of medicine abroad examined for medical licensure in the United States and its territories and possessions in 1949. The figures include both American and foreign-born physicians. There were graduates of 123 foreign medical schools and three licensing corporations represented, as compared with 102 in the previous year. Schools in 44 countries were represented. A total of 737 physicians were examined by 25 states, the District of Columbia, Alaska, Hawaii and Puerto Rico. Of the 737 physicians examined, 319 passed and 418 (56.7 per cent) failed. This extremely high percentage of failures is a primary factor in the cautious attitude of the licensing boards in admitting these graduates to the licensing examinations.

TABLE 31.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1949*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
1945	475	209	56.0
1946	495	221	55.3
1947	601	283	52.9
1948	639	311	51.3
1949	737	319	56.7
Totals	15,896	8,177	48.6

Graduates of the University of Vienna represented the largest group from any one school. Sixty-five graduates of this school were examined in eight states, 37 of whom failed. The greatest number examined by anyone state was 435 in New York, of whom 161 passed and 274 (63 per cent) failed. California examined 65, of whom 47.7 per cent failed, and Illinois examined 78 with 67.9 per cent failures. Other states examined 20 or less.

Table 31 presents the number of graduates of faculties of medicine abroad examined for medical licensure in the United States in 20 years (1930-1949). In 1936 the number of foreign trained physicians began to increase and by 1940 there were over three times as many as were tested in 1936. In 1949, 98 more foreign graduates were examined than in 1948. During the period 1930-1949 a total of 15,896 graduates of foreign schools were examined, of whom 8,177 passed and 48.6 per cent failed. At no time in this 20 year period did fewer than 30.7 per cent fail.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Eighteen states, the District of Columbia and Alaska have adopted by legislative action basic science requirements underlying the practice of the healing art. A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before the board and demonstrate his knowledge of the basic sciences. The basic science boards have no licensing powers. A certificate in the basic sciences is a prerequisite to licensure.

Connecticut and Wisconsin were the first states to adopt basic science legislation. Laws were passed in these two states in 1925. Texas was added to the group in 1949. The states and the year of enactment of their basic science laws are recorded in table 32.

TABLE 32.—*States Having Basic Science Laws and Year of Enactment*

Alaska	1946	Nebraska	1927
Arizona	1936	New Mexico	1942
Arkansas	1929	Oklahoma	1937
Colorado	1937	Oregon	1933
Connecticut	1925	Rhode Island	1940
District of Columbia	1929	South Dakota	1939
Florida	1939	Tennessee	1943
Iowa	1936	Texas	1949
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925

TABLE 33.—*Subjects Included in Basic Science Examinations*

	Examinations Required in							
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Alaska	+	+	+	..	+	+	+	..
Arizona	+	+	+	..	+	+	+	..
Arkansas	+	+	+	..	..	+	+	..
Colorado	+	+	+	..	..	+	+	..
Connecticut	+	..	..	+	+	+	+	..
Dist. Columbia	+	+	+	..	..	+	+	..
Florida	+	+	+	..	..	+	+	..
Iowa	+	+	+	..	+	+	+	..
Michigan	+	+	+	..	+	+	+	+
Minnesota	+	+	+	..	+	+	+	..
Nebraska	+	+	+	..	+	+	+	..
New Mexico	+	+	+	..	..	+	+	..
Oklahoma	+	+	+	..	..	+	+	..
Oregon	+	..	+	..	+	+	+	..
Rhode Island	+	+	+	..	..	+	+	..
South Dakota	+	+	+	..	..	+	+	..
Tennessee	+	+	+	..	..	+	+	..
Texas	+	+	+	..	+	+	+	+
Washington	+	..	+	..	+	+	+	..
Wisconsin	+	..	..	+	..	+	+	..

The subjects in which examinations are conducted are shown in table 33. These subjects are specified by statute. The examining boards have no authority to add any subjects or to refrain from examining in any subjects, although in some states provision is made for certification without examination, by waiver or exemption. The credentials acceptable for certification by this method are listed in table 34. All 20 boards examine in anatomy, pathology and physiology, 18 examine in chemistry, 16 in bacteriology, 10 in hygiene, 2 in diagnosis and 2 in public health.

The results of examinations held and the number of certificates issued on the basis of reciprocity, endorsement, waiver or exemption during 1949 are presented in tables 35 and 36. A candidate in applying for a

P—Passed; F—Failed.

basic science certificate is not required by law to mention his school of practice. However, by checking the biographic records of physicians and medical students on file in the office of the American Medical Association and various directories it has been possible to determine the branch of the healing art represented by the majority of candidates. Thus it has been possible to tabulate the figures in four groups; namely, physicians and medical students, osteopaths, chiropractors and unclassified applicants. The last category includes those for whom it was not possible to determine the profession represented. In Rhode Island doctors of dentistry and in Connecticut naturopaths are included in the unclassified group. It is probable that many in this unclassified group include osteopaths, chiropractors and also naturopaths who have not been identified by the reference data available.

TABLE 34.—*Reciprocity, Endorsement, Waiver or Exemption Policies of Basic Science Boards*

	Credentials Accepted
Alaska	Certificate of National Board of Medical Examiners and license issued in states with which the Alaska Board of Medical Examiners reciprocates.
Arizona	(1) Certificate of basic science boards that examine in same subjects as does Arizona. (2) Examinations in same subjects as Arizona requires of other basic science boards accepted. Applicant required to take examination in other subjects. (3) Applicants from states having basic science boards accepted if license was issued prior to enactment of basic science law.
Arkansas	Certificate of basic science boards of Colorado, Minnesota, Oregon, South Dakota, Tennessee, Texas and Wisconsin and of the National Board of Medical Examiners.
Colorado	(a) Certificates obtained by examination from the following basic science boards: Arizona, Arkansas, District of Columbia, Iowa, Minnesota, Nebraska, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee. (b) Applicants who present basic science certificates from Connecticut and Wisconsin boards are examined in chemistry and bacteriology.
Connecticut	No reciprocity. Board may in its discretion waive examination.
District of Columbia	Board may exempt an applicant and accept in lieu of examination proof that the applicant has passed before a basic science or licensing board an examination in subjects required by District of Columbia basic science board. Diplomates of the National Board of Medical Examiners may also be exempt from examination.
Florida	None.
Iowa	Credentials equal to those of Iowa basic science board.
Michigan	Certificates from Minnesota and Nebraska basic science boards.
Minnesota	(a) Certificate of basic science boards of Arkansas, Colorado, Michigan, Nebraska, Oklahoma, Oregon and Tennessee. (b) Applicants from Arizona, South Dakota, Texas and New York (subsequent to 1925) considered on individual basis. (c) Credit given for Alabama's licensing board's grades in physiology, chemistry and anatomy; Wisconsin's basic science board's grades in anatomy, pathology and physiology and New York's licensing board's grades prior to 1925 in anatomy, chemistry, hygiene and physiology. (d) Certificate of National Board of Medical Examiners.
Nebraska	Certificate issued by waiver to applicants who have passed a written examination before another basic science board or licensing board in the six subjects required by Nebraska basic science board.
New Mexico	None.
Oklahoma	A certificate of ability in the basic sciences is a prerequisite to examination for license (but not to license by reciprocity) by the Oklahoma Board of Medical Examiners. This certificate may be issued on the basis of exemption.
Oregon	Certificate in the basic sciences obtained by examination in Arkansas, Colorado, Iowa, Minnesota, Nebraska, South Dakota, Tennessee, Texas and Wisconsin.
Rhode Island	None.
South Dakota	Certificate of basic science boards of Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, Tennessee, Texas and Wisconsin.
Tennessee	(a) Certificate of basic science boards of Arizona, Arkansas, Colorado, District of Columbia, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota, Texas, Virginia and Wisconsin. (b) Granting of a certificate by waiver by accepting grades in required subjects earned by examination before a medical examining board or the National Board of Medical Examiners is handled on an individual basis.
Texas	Certificate of basic science boards of Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota and Tennessee.
Washington	None.
Wisconsin	(a) Certificate of basic science boards of Arkansas, Iowa, Oregon, South Dakota and Tennessee. (b) Certificate attesting to service in the Medical Corps of the Armed Forces of the United States. (c) License to practice medicine or osteopathy in another state provided applicant has practiced for at least one year since license was granted.

TABLE 35.—*Applicants Examined in Basic Sciences, 1949*

	Physicians and Medical Students		Osteopaths		Chiropractors		Unclassified and Others		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Alaska	3	0	0	1	0	0	0	0	4	3	1	25.0
Arizona	52	0	2	0	1	0	10	0	89	65	24*	27.0
Arkansas	108	2	0	0	5	6	0	0	121	113	8	6.6
Colorado	131	13	19	12	3	8	6	5	197	159	38	19.3
Connecticut	139	2	2	0	9	12	3	2	169	153	16	9.5
Dist. of Columbia	16	5	0	0	0	0	0	0	21	16	5	23.8
Florida	351	84	28	35	14	32	37	38	619	430	189	30.5
Iowa	155	95	216	180	246	328	206	277	1,703	823	880	51.7
Michigan	319	78	4	5	10	9	13	9	447	346	101	22.6
Minnesota	227	0	48	0	31	0	66	0	685	372	313*	45.7
Nebraska	76	21	9	3	0	0	0	0	109	85	24	22.0
New Mexico	60	1	15	2	0	0	6	0	84	81	3	3.6
Oklahoma	65	2	0	3	0	0	4	3	77	69	8	10.4
Oregon	98	21	9	27	5	3	15	31	209	127	82	39.2
Rhode Island **	35	1	0	0	0	0	23	1	60	58	2	3.3
South Dakota	36	10	3	3	1	2	4	8	67	44	23	34.3
Tennessee	200	33	0	0	0	0	14	2	249	214	35	14.1
Texas	72	1	9	5	0	0	0	0	87	81	6	6.9
Washington	231	12	6	2	0	2	0	0	253	247	16	6.3
Wisconsin	166	11	0	1	14	66	0	0	258	180	78	30.2
Totals—Examined	2,932		649		807		783		5,508			
Totals—Passed	2,540		370		339		407			3,656		
Totals—Failed	392		279		468		376				1,852	
Percentage Failed	13.4		42.9		57.9		48.0					33.6

* Nature of practice undeterminable since names of failures not supplied.

** Figures in unclassified column refer to doctors of dentistry.

TABLE 36.—*Basic Science Certificates Issued by Examination, Reciprocity and Endorsement, 1949*

	Examination					Reciprocity, Endorsement, Exemption or Waiver					
	Physicians and Medical Students	Osteopaths	Chiropractors	Unclassified and Others	Totals	Physicians and Medical Students	Osteopaths	Chiropractors	Unclassified and Others	Totals	Registered
Alaska	3	0	0	0	3	13	0	4	0	17	20
Arizona	52	2	1	10	65	37	48	23	31	139	204
Arkansas	108	0	5	0	113	42	7	4	0	53	166
Colorado	131	19	3	6	159	36	28	27	22	113	272
Connecticut	139	2	9	3	153	0	0	0	0	0	153
District of Columbia	16	0	0	0	16	112	0	0	0	112	128
Florida	351	28	14	37	430	0	0	0	0	0	430
Iowa	155	216	240	206	823	227	23	11	16	277	1,100
Michigan	319	4	10	13	346	38	14	13	61	125	472
Minnesota	227	48	31	66	372	124	0	2	16	142	514
Nebraska	76	9	0	0	85	0	0	0	0	0	85
New Mexico	60	15	0	6	81	0	0	0	0	0	81
Oklahoma	65	0	0	4	69	0	0	0	0	0	69
Oregon	98	9	5	15	127	58	25	38	32	153	280
Rhode Island *	35	0	0	23	58	0	0	0	0	0	58
South Dakota	36	3	1	4	44	8	11	2	0	21	65
Tennessee	200	0	0	14	214	108	0	0	0	108	322
Texas	72	9	0	0	81	0	0	0	0	0	81
Washington	231	6	0	0	237	0	0	0	0	0	237
Wisconsin	166	0	14	0	180	137	1	81	0	219	399
Totals	2,540	370	339	407	3,656	940	157	205	178	1,480	5,136

* Figures in unclassified column refer to doctors of dentistry.

There were 5,508 candidates examined by the 20 boards in operation in 1949. The numbers examined in the various groups and the total examined by each board are shown in table 35. The majority (2,932) represented physicians or medical students, 649 were osteopaths, 807 chiropractors and 783 were placed in the unclassified group. Of all applicants, 33.6 per cent failed. Among physicians and medical students 13.4 per cent failed, osteopaths 42.9 per cent, chiropractors 57.9 per cent and unclassified 48 per cent. Among those who passed there were 2,540 physicians and medical students, 370 osteopaths, 339 chiropractors and 407 unclassified candidates. The basic science board of Iowa and Florida examined the greatest number of applicants. Iowa examined 1,703 and Florida 619. Michigan and Minnesota tested more than 400 and Oregon, Tennessee, Washington and Wisconsin more than 200. The percentage of failures for physicians and medical students is greater than the extent of failures before the state examining boards.

TABLE 37.—*Total Candidates for Basic Science Certification, 1927-1949*

	No. of Boards	Physicians and Medical Students						Other Practitioners					
		Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	158	70	88	55.7	26	96
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	294	391
1940	16	1,303	1,140	163	12.5	324	1,464	280	153	127	43.9	22	175
1941	17	1,768	1,560	208	11.8	280	1,840	356	191	165	46.3	73	264
1942	17	1,725	1,476	249	14.4	213	1,689	497	249	248	49.9	91	340
1943	18	2,330	2,098	232	10.0	296	2,394	389	211	178	45.8	86	297
1944	18	2,284	1,868	416	18.2	222	2,090	465	276	189	40.6	87	363
1945	18	2,576	2,146	430	16.6	412	2,558	397	193	204	51.4	172	365
1946	19	2,937	2,391	546	18.7	1,308	3,699	313	167	146	46.6	166	333
1947	19	3,132	2,405	727	23.2	771	3,176	406	228	178	43.8	189	417
1948	19	3,080	2,681	399	13.3	1,009	3,670	827	437	390	47.1	349	786
1949	20	2,932	2,540	392	13.4	940	3,480	2,239	1,116	1,123	50.2	540	1,656
Totals		34,498	29,486	5,012	14.5	8,094	37,580	7,319	3,743	3,576	48.9	2,160	5,903

It is the policy of the Arizona and Minnesota boards in reporting results of its examinations to omit the names of applicants who fail examinations. The number who fail are therefore recorded only in the total column.

Physicians or medical students were tested in all states, osteopaths by 16 boards and chiropractors by 12 states.

Twelve boards issued 1,480 certificates by reciprocity, endorsement, waiver or exemption. The number of successful applicants (5,136) registered by examination and by endorsement are recorded in table 36. Included in the total certified were 3,480 physicians, 527 osteopaths, 544 chiropractors and 585 unclassified.

In table 37 is included the number of candidates examined and certified by basic science boards for each year since and including 1927. The number registered in 1949 was 870 greater than the previous year and represents the largest number to appear before basic science boards since their inception.

In the 23 year period shown in this table, 34,498 physicians or medical students were examined, of whom 29,486 were successful in these examinations. In the same period 7,319 other practitioners were tested and 3,743 were successful. Of the physicians and medical students examined in 23 years, 14.5 per cent failed and 48.9 per cent of the other practitioners were unsuccessful. There were in this same period 8,094 physicians and 2,160 others certified without examination. By both examination and endorsement there were 37,580 physicians and medical students issued certificates in 23 years and 5,903 certificates were issued to other practitioners.

The fees for examination in the basic sciences in the states requiring such certification are as follows:

Alaska	$25	Nebraska	$10[2]
Arizona	20	New Mexico	25
Arkansas	10	Oklahoma	15[3]
Colorado	25	Oregon	10
Connecticut	10	Rhode Island	10
District of Columbia	25	South Dakota	15
Florida	10	Tennessee	10[4]
Iowa	10	Texas	15[1]
Michigan	35	Washington	10
Minnesota	15[1]	Wisconsin	10[5]

1. Reciprocity, $25. 2. Waiver, $15. 3. Reciprocity, $50.
4. Reciprocity, $5. 5. Reciprocity, $15.

Examinations are given in most instances twice a year, although a number of boards hold examinations quarterly.

The principle of basic science legislation is to provide a means of insuring that all who seek licensure to care for sick and injured persons shall first possess a reasonable knowledge of the sciences fundamental to the healing art. The enforcement of such laws affects mostly the group classified as "other practitioners." This is particularly significant since the testing is made by nonmedical examiners. The results would seem to indicate that, in general, practitioners other than physicians are inadequately equipped in the fundamentals of medicine.

The present executive officer of each of the 20 basic science boards is as follows:

Arizona—Mr. Francis A. Roy, Science Hall, University of Arizona, Tucson.
Arkansas—Mr. L. E. Gebauer, 1002 Donaghey Building, Little Rock.
Colorado—Esther B. Starks, D.O., 1459 Ogden Street, Denver.
Connecticut—Mr. C. M. Bakewell, 110 Whitney Avenue, New Haven.
District of Columbia—Dr. Daniel L. Seckinger, 4130 East Municipal Building, Washington.
Florida—Mr. M. W. Emmel, University of Florida, Gainesville.
Iowa—Dr. Ben H. Peterson, Coe College, Cedar Rapids.
Michigan—Miss Eloise LeBeau, 101 North Walnut Street, Lansing.
Minnesota—Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.
Nebraska—Mr. Oscar F. Humble, Room 1009, State Capitol Building, Lincoln 9.
New Mexico—Mrs. Marguerite Cantrell, P. O. Box 1522, Santa Fe.
Oklahoma—Dr. Frank C. Gallagher, 813 Braniff Building, Oklahoma City.
Oregon—Dr. C. D. Byrne, University of Oregon, Eugene.
Rhode Island—Mr. Thomas B. Casey, 366 State Office Building, Providence.
South Dakota—Dr. G. M. Evans, 310 East 15th Street, Yankton.
Tennessee—Dr. O. W. Hyman, 874 Union Avenue, Memphis.
Texas—Bro. Raphael Wilson, 306 Nalle Bldg., Austin.
Washington—Mr. Edward C. Dohm, Olympia.
Wisconsin—Mr. William H. Barber, Watson and Scott Streets, Ripon.
Alaska—Dr. C. Earl Albrecht, Box 1931, Juneau.

NATIONAL BOARD OF MEDICAL EXAMINERS

The medical licensing boards of 45 states, the District of Columbia, the territories of Alaska, Hawaii and Puerto Rico and the Canal Zone recognize the certificate of the National Board of Medical Examiners as an adequate qualification for a medical license. Florida, Montana and Wisconsin do not recognize the National Board certificate.

The licensing board of Louisiana exempts diplomates of the National Board from the state examination if they have also been licensed in some other state with which Louisiana has established reciprocal relations. The laws or regulations of the licensing boards in Hawaii, Illinois, Rhode Island and Wyoming require diplomates of the National Board to take an oral examination. A brief supplemental examination is required in Maine and in Michigan. The states, territories and possessions which will endorse the National Board certificate are recorded in table 38.

In addition to the boards of medical licensure, 18 of the states, the District of Columbia and Alaska have established separate examining boards in the basic sciences. The laws of nine of these boards are sufficiently broad to enable them to accept the examinations of the National Board in lieu of their own. These include the boards of Alaska, Arkansas, Connecticut, Iowa, Minnesota, Oklahoma, Tennessee and the District of Columbia. The Nebraska Board accepts the National Board's examinations in most instances after reviewing the answer papers. Diplomates are required to take an examination in the basic sciences before obtaining a medical license in Arizona, Colorado, Florida, Michigan, New Mexico, Oregon, Rhode Island, South Dakota, Texas, Washington and Wisconsin.

Diplomates of the National Board are admitted to the final examination of the Examining Board in England, of the Triple Qualification Board of Scotland and of the Conjoint Board in Ireland. The National Board admits directly to parts II and III of its examinations the diplomates of these boards, provided they hold a degree in medicine from an acceptable university. Diplomates are also exempt from some of the qualifications required by the Mayo Foundation for Medical Education and Research.

The board's examinations are also accepted by many medical schools as part of their own examination and promotion procedures. At some of the schools the students are required to pass part I at the end of the second year and part II at the end of the fourth year. Other schools require only that part II be passed by the end of the fourth year. In addition, there are a few schools at which those students who voluntarily take and pass the board's examinations, either in part I or part II, are excused from the corresponding final school examinations.

Requirements for admission to the National Board examination include a standard four year high school course, two years of acceptable college work including courses in English, physics, chemistry and biology, and medical training satisfactorily completed in approved medical schools in the United States and Canada. Graduates of the university medical schools of Great Britain and Ireland have been admitted to the examinations, provided these graduates have been licensed to practice in the country in which the school attended is located. The National Board may also consider individually applicants who present credentials from other universities, the records of which have been adequately verified, with further evidence of having completed acceptable professional service in the United States and who have complied with the requirements of full citizenship in the United States. At a meeting held in April 1950 the National Board voted to accept the list of foreign medical schools, dated Feb. 7, 1950, prepared by the Council on Medical Education and Hospitals and and the Executive Council of the Association of American Medical Colleges.

Data regarding the examinations conducted and the issuance of certificates by the National Board are presented for the thirty-first consecutive year.

The National Board was founded in 1915 by Dr. W. L. Rodman, then president of the American Medical Association. The first examination for certification was given in October 1916. From that date up to and including a test given in June 1921, eleven examinations were given and 268 candidates were certified. The results of each examination during this period are given in table 39.

Since 1922 the examination has been divided into three parts, which must be taken and completed in the following sequence: part I, a written examination in each of the six fundamental medical sciences; part II, a written examination in five major clinical subjects, and part III, a clinical and practical examination in six major clinical divisions and their component subjects or subdivisions. Parts I and II are given in approved medical schools throughout the United States and Canada, while part III is given under the direction of local subsidiary boards in 27 centers at times sufficiently frequent to accommodate all eligible candidates. Examinations in parts I and II are held simultaneously in February, June and September. An additional examination in part II only is held in April.

The remainder of the tables enumerate the results of examinations in parts I, II and III for each calendar year since 1922, including those who passed and failed examinations and those certified.

A candidate is eligible for part I who has met the premedical requirements and has completed successfully the first two years of work in an approved medical

TABLE 38.—*Licensing Boards Endorsing the Certificate of the National Board of Medical Examiners*

Alabama	Illinois [1]	Nebraska [3]	Puerto Rico
Alaska [3]	Indiana	Nevada	Rhode Island [1]
Arizona	Iowa [3]	New Hampshire	South Carolina
Arkansas [3]	Kansas	New Jersey	South Dakota
California	Kentucky	New Mexico	Tennessee [3]
Canal Zone	Louisiana	New York	Texas
Colorado	Maine [2]	North Carolina	Utah
Connecticut [3]	Maryland	North Dakota	Vermont
Delaware	Massachusetts	Ohio	Virginia
Dist. of Columbia [3]	Michigan [2]	Oklahoma [3]	Washington
Georgia	Minnesota [3]	Oregon	West Virginia
Hawaii [1]	Mississippi	Pennsylvania	Wyoming [1]
Idaho	Missouri		

1. Oral examination required.
2. Brief supplemental written examination required.
3. Examination in basic sciences accepted by state basic science board.

TABLE 39.—*National Board Examinations, 1916-1921*

Date		Total Examined	Failed	Percentage Failed
October	1916	10	5	50.0
June	1917	12	3	25.0
October	1917	28	6	21.4
January	1918	20	2	10.0
April	1918	23	5	21.7
December	1918	16	1	6.3
June	1919	52	1	1.9
February	1920	48	12	25.0
May	1920	60	14	23.3
February	1921	16	5	31.3
June	1921	40	3	7.5
Totals		325	57	17.5

school. An incomplete examination is allowed candidates taking part I at the end of their second medical year in schools whose third year curriculum includes courses in one or two subjects of this part. The examinations in the subjects not yet completed are postponed and may be taken at any examination period after the candidate has completed them in his medical school. They are recorded in these tabulations under the heading "Incomplete Examinations" and are excluded from the calculations referring to the percentage of failures.

A candidate is eligible for part II who has passed part I and has completed satisfactorily a four year medical course in an approved medical school.

A candidate is eligible for part III who has passed parts I and II, received his medical degree and has satisfactorily completed an internship of one year in a hospital approved for such training by the American

TABLE 40.—*National Board Examinations in Part I, 1922-1949*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1949	534	441	38	55	11.1
June 1949	2,073	1,145	832	96	7.7
September 1949	1,216	751	373	92	10.9
Totals	3,823	2,337	1,243	243	9.4
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	698	460	50	188	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,069	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,807	1,204	471	192	13.8
1943	2,056	1,441	962	253	14.9
1944	4,229	2,326	1,465	438	15.9
1945	3,265	2,106	1,475	284	11.8
1946	3,148	1,695	1,189	264	13.5
1947	3,514	1,844	1,352	318	14.7
1948	3,807	2,178	1,262	367	14.4
1949	3,823	2,337	1,243	243	9.4
Totals	49,311	29,352	15,179	4,780	14.0

or Canadian medical associations or has served in a laboratory acceptable to the National Board.

Three examinations were given in part I in 1949 and four in part II, while tests in part III were held at various times during the year.

Tables 40 and 41 record the results of examinations given in parts I and II during 1949 and since 1922. The data shown represent examinations conducted rather than persons examined. The figures include candidates who fail and are reexamined during the same year and those who pass parts I and II in the same year.

During the year 1949, 3,823 examinations were given in part I; 2,337 passed and 243, or 9.4 per cent, failed. There were 1,243 incomplete examinations given. In part II, 1,737 examinations were held; 1,691 passed and 46, or 2.6 per cent, failed. Incomplete examinations are seldom given in this part. There were none given in 1949.

Since 1922 a total of 49,311 examinations have been given in part I and 24,967 in part II. During this period 29,352 passed part I and 23,612 passed part II. In 28 years there have been 4,780 failures in part I (14 per cent) and 1,309 (5.2 per cent) in part II. The increasing acceptance by medical schools of the National Board's examinations is reflected in the totals in these two parts, particularly since 1943. The greatest number of examinations were given in 1944 and in part II in 1943.

TABLE 41.—*National Board Examinations in Part II, 1922-1949*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1949	228	216	0	12	5.2
April 1949	1,088	1,062	0	26	2.4
June 1949	324	317	0	7	2.1
September 1949	97	96	0	1	1.0
Totals	1,737	1,691	0	46	2.6
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	389	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	708	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,861	1,805	0	56	3.0
1944	1,405	1,350	0	55	3.9
1945	1,599	1,565	0	34	2.1
1946	1,825	1,782	0	43	2.4
1947	1,641	1,613	0	28	1.7
1948	1,742	1,725	0	17	0.9
1949	1,737	1,691	0	46	2.6
Totals	24,967	23,612	46	1,309	5.2

In 1949, 1,684 tests were given in part III; 1,674 passed and 11 (0.6 per cent) failed. Results of examinations in this part in 1949 and since 1922 are given in table 42. In the 28 years shown 20,688 candidates were tested, of whom 20,167 were granted the certificate of the board. The percentage of failures in this final examination in the 28 year period was 2.5. Since

TABLE 42.—*National Board Examinations in Part III, 1922-1949*

Date	Total Examinations	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	792	771	21	2.7
1941	910	885	25	2.7
1942	1,054	1,041	13	1.2
1943	1,230	1,213	17	1.4
1944	1,168	1,146	22	1.8
1945	1,245	1,232	13	1.0
1946	1,634	1,613	21	1.2
1947	1,741	1,723	18	1.0
1948	1,715	1,700	15	0.9
1949	1,685	1,674	11	0.6
Totals	20,688	20,167	521	2.5

1915, when the board's first examination was given, 20,435 candidates have been certified.

The 1,674 physicians certified as diplomates last year represented 65 medical schools in the United States,

TABLE 43.—*Diplomates from Individual Medical Schools, 1949*

College of Medical Evangelists	29	Ohio State University	1
Stanford University	4	New York Medical College	112
University of California	2	New York University	109
Univ. of Southern California	3	Syracuse University	23
University of Colorado	4	University of Buffalo	67
Yale University	48	University of Rochester	47
George Washington University	75	Duke University	62
Georgetown University	84	Bowman-Gray School of Med	2
Howard University	5	Western Reserve University	6
Emory University	1	University of Oklahoma	2
Medical College of Georgia	2	University of Oregon	10
Loyola University	11	Hahnemann Medical College	22
Northwestern University	25	Jefferson Medical College	11
University of Chicago	10	Temple University	16
University of Illinois	16	University of Pennsylvania	32
Indiana University	3	University of Pittsburgh	3
State University of Iowa	25	Woman's Medical College	11
University of Kansas	2	Med. College of South Carolina	2
University of Louisville	13	Meharry Medical College	5
Tulane University	4	University of Tennessee	2
Johns Hopkins University	14	Vanderbilt University	6
University of Maryland	9	Baylor University	3
Boston University	59	University of Texas	2
Harvard Medical School	106	University of Utah	7
Tufts College Medical School	85	University of Vermont	21
University of Michigan	42	Medical College of Virginia	2
Wayne University	9	University of Virginia	1
University of Minnesota	15	Marquette University	18
St. Louis University	14	University of Wisconsin	2
Washington University	6	McGill University	18
Creighton University	8	Queen's University	3
University of Nebraska	11	University of Manitoba	1
Albany Medical College	39	University of Toronto	4
Columbia University	91	University of Western Ontario	1
Cornell University	63	Foreign Schools	11
Long Island College of Medicine	87		
Total			1,674

five in Canada and seven universities in other countries. The school and the number of examinees from each are included in table 43.

TABLE 44.—*Parts I, II and III, Excluding Duplications, 1922-1949*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
1922	535	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.9
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,188	2,597	363	228	8.1
1941	3,318	2,749	332	237	7.9
1942	3,607	3,014	391	202	6.3
1943	4,514	3,671	606	237	6.1
1944	5,363	4,235	759	369	8.0
1945	5,614	4,468	886	260	5.5
1946	5,912	4,730	898	284	5.7
1947	6,249	4,965	1,002	282	5.3
1948	6,389	5,194	902	293	5.3
1949	6,493	5,376	880	237	4.2
Totals	84,629	67,294	11,843	5,492	7.5

Physicians who earn the Certificate of the National Board are designated as diplomates and are privileged to use in any proper manner the designating initials, D.N.B. The diplomates have formed a national organization entitled The Associated Diplomates of the National Board, which meets at the time and place of the annual meetings of the American Medical Association and of the Southern Medical Association.

The present schedule of examination fees is as follows: part I, $20; part II, $15 and part III, $40, a total of $75.

The figures presented in the preceding tables represent examinations given. The number of persons tested during any one year is recorded for the 28 year period in table 44. The classification "passed" or "failed" in cases in which more than one examination has been taken in a given year was based on the results of the last examination during the year in question. Thus, if in 1949 a candidate passed part I but at a subsequent examination in 1949 he failed part II, he is computed in this tabulation as having failed. On this basis figures computed indicate that there were 6,493 who took at least one of the tests of the National Board in 1949 as compared with 525 in 1922. The trend has been steadily upward. In 1949 the number of candidates was 104 greater than in the preceding year. For

TABLE 45.—*Licenses Granted on the Basis of National Board Certificates, 1949*

Alabama	8	New Jersey	102
Arizona	14	New Mexico	5
Arkansas	3	New York	756
California	215	North Carolina	42
Colorado	17	North Dakota	4
Connecticut	128	Ohio	69
District of Columbia	102	Oklahoma	11
Georgia	10	Oregon	27
Idaho	15	Pennsylvania	107
Illinois	77	Rhode Island	22
Indiana	11	South Carolina	11
Iowa	33	South Dakota	6
Kansas	20	Tennessee	14
Kentucky	13	Texas	30
Maine	27	Utah	12
Maryland	45	Vermont	23
Massachusetts	273	Virginia	31
Michigan	34	Washington	43
Minnesota	64	West Virginia	11
Mississippi	4	Wyoming	2
Missouri	30	Alaska	3
Nebraska	5	Hawaii	12
Nevada	5	Puerto Rico	6
New Hampshire	34		
Total			2,536

the 28 year period, 84,629 persons were examined in one or more of the annual examinations, of whom 67,294 passed, 11,843 took incomplete examinations and 5,492 (7.5 per cent) failed.

The total number of diplomates granted licenses in 1949 to practice medicine on the basis of their National Board certificate in 43 states, the District of Columbia, Alaska, Hawaii and Puerto Rico was 2,536. The number so registered by each licensing board is shown in table 45, and 17,530 have been so licensed since the board was formed. In the same period, however, 20,167 received the certificate of the board.

The constitution of the National Board of Medical Examiners provides for a membership of 33 persons, representing the federal services, the Federation of State Medical Boards of the United States, the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association and members elected at large. The president of the board is Borden S. Veeder, M.D., St. Louis; the medical secretary is J. Stewart Rodman, M.D., and the executive secretary and treasurer is Mr. E. S. Elwood. The address of the board is 225 South 15th Street, Philadelphia 2.

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SATURDAY, JUNE 3, 1950

THE FORTY-EIGHTH ANNUAL REPORT ON MEDICAL LICENSURE

The forty-eighth annual report on medical licensure by the Council on Medical Education and Hospitals which appears in this issue of THE JOURNAL presents statistics concerning the medical examination and the licensure of physicians in the United States and its territories and outlying possessions for the year 1949 and summarizes trends over many years. There is also included information pertaining to the current regulations for medical licensure.

During the year 1949 there were 12,181 licenses to practice medicine issued by the medical examining boards of the 48 states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands. Of the 12,181 licenses issued, 5,252 were granted after written examination and 6,929 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners. There was a decrease of 1,411 in the number of physicians licensed in 1949 as compared with the previous year, although the number of licenses granted exceeded the average annual prewar registration by more than 3,000. The continuing decrease in the number of licenses issued annually since 1946, when 16,236 physicians were licensed, indicates that the entry or return to medical practice of physicians who served in the armed forces during the war is nearing completion.

The data presented indicates that last year 5,866 physicians received their first license to practice medicine and thus represent additions to the medical profession. In the same period there were 3,600 deaths of physicians reported, resulting in a net gain of 2,266. The registration of physicians revealed that 93.7 per cent were graduates of approved medical schools in the United States and Canada. Four per cent of the physicians registered were graduates of foreign medical faculties.

The percentage of failures from existing United States schools was 3.2; of graduates of unapproved medical schools in the United States 34.7 per cent failed; graduates of schools of osteopathy admitted to the medical licensure examinations in several states represented 42.1 per cent failures, and 56.7 per cent of the foreign-trained physicians examined for medical licensure last year failed. The total percentage of failures was 12.5.

The second section of the report pertains to the results of examinations given by the 20 boards of examiners in the basic sciences. Certificates in the basic sciences were issued to 5,136 candidates in 1949. Among graduates of approved medical schools in the United States, foreign-trained physicians, graduates of unapproved medical schools and medical students, 13.4 per cent failed. There were 42.9 per cent failures in these examinations by graduates of schools of osteopathy, and 57.9 per cent of the graduates of chiropractic schools failed.

The final section of the report deals with the examinations given by the National Board of Medical Examiners. The examination of the national board is given in three parts; the first part may be taken after completion of the sophomore year in medical school, the second part on completion of the medical course and the third part after a year of hospital service. There were 6,493 persons who took at least one of the tests of the national board in 1949, and 1,674 physicians were certified as diplomates. The medical licensing boards of 45 states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Canal Zone recognize the certificate of the National Board of Medical Examiners as an adequate qualification for a medical license. The total number of diplomates granted licenses in 1949 to practice medicine on the basis of this certificate was 2,536.

The presentation of this study is made available through the cooperation of the various examining and licensing boards. For their cooperation the Council and THE JOURNAL wish to express appreciation.

LICENSURE OF FOREIGN MEDICAL GRADUATES

The annual report of the Council on Medical Education and Hospitals on licensure statistics in this issue of THE JOURNAL reveals that encouraging progress is being made in developing sound policies for the licensure of foreign-trained physicians. This problem has been receiving serious study for the past three years by the Committee on Foreign Medical Credentials, an advisory committee to the Council made up of representatives of 18 interested organizations and government agencies.

On the recommendation of this Committee the Council and the Association of American Medical Colleges undertook last year to prepare a list of foreign medical schools whose graduates they could recommend for consideration by medical institutions and medical organizations in the United States on the same basis as graduates of approved medical schools in the United

States. The first list of such schools was published in February of this year.[1] Already 14 state licensing boards and the National Board of Medical Examiners have adopted this list. Several other states have reported that adoption of the list will be formally considered at meetings of their boards in the near future. In several instances the boards have indicated that graduates from other foreign schools will not be excluded from licensure but will be considered on an individual basis.

In the past year six states that heretofore did not license foreign physicians have modified their regulations and now accept such candidates. One state that accepted foreign graduates until this year has ruled that foreign-trained physicians are no longer eligible for licensure. Altogether 36 of the 53 licensing boards in the United States, its territories and outlying possessions now admit graduates of foreign medical schools to their licensing examinations under various conditions.

It is clear that in publishing their preliminary list last February the Council and the Executive Council have already made an important contribution to the solution of a difficult problem. As information is compiled that will permit the listing of additional foreign schools the value of this contribution will increase.

WELL WATERS AND METHEMOGLOBINEMIA IN INFANTS

The Committee on Sanitary Engineering and Environment of the Division of Medical Sciences of the National Research Council has issued a report on methemoglobinemia and nitrates[1] which reviews the relationship between infant morbidity and mortality and the quality of well water. The problem has been recognized by health departments for some time, but ways of preventing it have been difficult to attain because bases for establishing permissible limits of certain chemical characteristics have been lacking. The report by the committee provides a review of known data and offers several pertinent conclusions.

In 1945 H. H. Comly[2] reported instances of "idiopathic" methemoglobinemia in infants following the ingestion of well water containing large amounts of nitrates. Since then other reports have appeared, until a large number of instances have been recorded. In every case the baby was fed on an artificial formula of cow's milk, condensed milk or milk powder diluted with well water. Usually the wells from which the water was obtained were dug, not drilled, had inadequate or no casings and were unsatisfactorily located and constructed. In many instances they showed evidence of pollution. With only a few questionable exceptions the water when analyzed chemically was found to have a high content of nitrate nitrogen and sometimes traces of nitrites. In some cases temporary discontinuance of the formula caused the cyanosis to disappear, only to reappear when the doubtful formula was resumed. When the formula was changed to one with water of low nitrate nitrogen content, the cyanosis disappeared. If the condition was permitted to continue untreated, it sometimes progressed to death. A special survey by the Minnesota State Department of Health revealed 139 cases in two and one-half years; there were 14 deaths. Apparently susceptibility to the development of methemoglobinemia decreases rapidly after the first two months of life and is rarely encountered after six months.

Experimental studies have shown that nitrates as such are harmless to humans but become injurious when reduced to nitrites which are absorbed in the blood. Cornblath and Hartman[3] have produced methemoglobinemia in infants by feeding them formulas containing well water to which nitrates have been added. Apparently a number of factors, some of which are not known or well understood, influence the borderline of safety. However, the danger zone probably begins when the concentration of nitrate nitrogen reaches 20 parts per million of water.

Physicians are not officially required to report methemoglobinemia to health authorities, and the data collected so far stem from reports in medical and allied journals and from special inquiries. These reveal, however, a health problem worthy of careful study. Certain geographic locations seem to produce more cases than other areas. Although one might expect some of these observations to have been gathered from persons using public water supplies secured from wells and springs, strangely no such case has been reported at this time in spite of the fact that nitrate nitrogen concentration at least on some occasions is high. So far the cases reported have been associated only with the use of water from private household supplies of well water. Perhaps there is a difference between nitrate nitrogen derived from organic and inorganic sources, or some other factor or factors may be responsible for the observations reported.

The Committee on Sanitary Engineering and Environment has concluded that available information does not justify the stating of a safe limit for nitrate nitrogen content in public water supplies, that further studies are needed, that pending such studies water from private household well supplies having a nitrate nitrogen content in excess of 10 parts per million should be considered unsafe for infant feeding and that plants producing ammonium nitrates for fertilizer use should control their industrial waste water. These conclusions of the committee are of timely importance.

1. J. A. M. A. **142**: 571 (Feb. 25) 1950.

1. Maxcy, K. F.: Report on the Relation of Nitrate Nitrogen Concentration in Well Waters to the Occurrence of Methemoglobinemia in Infants, Bulletin Committee on Sanitary Engineering and Environment, National Research Council, 1950, Appendix D.

2. Comly, H. H.: Cyanosis in Infants Caused by Nitrates in Well Water, J. A. M. A. **129**: 112 (Sept. 8) 1945.

3. Cornblath, M., and Hartman, A. F.: Methemoglobinemia in Young Infants, J. Pediat. **33**: 421 (Oct.) 1948.

Current Comment

SECOND SURVEY OF COLLEGE HEALTH SERVICES

The Bureau of Medical Economic Research is conducting a survey of the university and college health services for the academic year 1949-1950 to bring up to date the 1936 study, "University and College Student Health Services," by the Bureau of Medical Economics. The purpose of the present survey is to determine what health services are being rendered by the college directly or by community physicians and hospitals through the college health service offices, and how these services are being financed. A twelve page schedule is being sent to 1,150 colleges and universities to obtain data for faculty members, nonacademic employees and students. Insurance contracts with Blue Cross and Blue Shield plans and insurance companies, which have been made by some universities and colleges in addition to, or instead of, other methods of financing health services, are being surveyed. The schedule also includes a number of questions on costs, facilities and personnel of the college health service. The full cooperation of physicians in college communities and those who serve as directors of college health services will be needed in this important study. The health services available to the faculty and nonacademic employees as well as to almost three million college students are of great interest and importance to American medicine.

ONCOLYTIC VIRUSES

Demonstration of the tumor-necrotizing effect of Russian Far East encephalitis virus when tested against mouse sarcoma [1] led Sharpless [2] and his associates of the Lederle Laboratory, Pearl River, N. Y., to test the action of numerous other viruses against transplantable malignant lymphoid tumors of chickens.[3] To prepare the chicks, fragments of this tumor were homogenized with a saline solution and 0.25 cc. of a 1:1,000 suspension of the resulting emulsion injected into the left pectoral muscle. At the time of inoculation the majority of the chicks were 14 days old. In these young chicks the tumor grows rapidly. About 95 per cent of them die within eight days after the tumor becomes palpable. The following viruses were tested against this tumor: mumps, swine influenza, canine distemper, Bwamba, Samliki Forest, Ilhaus encephalitis, eastern and western equine encephalomyelitis, rabies, Russian spring-summer, West Nile, Japanese B and St. Louis encephalitis and louping-ill. Two to four days after the tumor inoculation, 0.4 to 0.5 cc. of a 1:100 dilution of one of the viruses was injected either into the same or the opposite breast. Most of these viruses were without tumor-necrotizing action. Five of the neurotropic viruses, however, had oncolytic properties. These were: Russian spring-summer, West Nile, Japanese B and St. Louis encephalitis and louping-ill. In many of the chicks treated two days after tumor inoculation palpable tumors did not develop. In most of the others the tumors remained small and regressed completely in five to ten days. The survival rate was about 88 per cent in a typical group of 112 treated chicks, with a mortality of 94 per cent in 95 untreated controls. Equally striking results were obtained when the virus was injected into the same or the opposite breast. Chicks in which the tumors had regressed usually remained healthy. Thirty days later they were found to be immune to a second tumor inoculation. Among 185 challenged survivors 95 per cent were fully resistant. The five oncolytic viruses are relatively nonpathogenic for chicks but are highly pathogenic and impractical for use in public health or veterinary medicine. Search for safer viruses is now in progress.

1. Moore, A. E.: Cancer **2**: 516-525, 1949.
2. Sharpless, G. R.; Davis, M. C., and Cox, H. R.: Proc. Soc. Exper. Biol. & Med. **73**: 270 (Feb.) 1950.
3. Olson, C.: Cancer Research **1**: 384, 1941.

HISTOLYTIC ANTIBIOTICS

The two new antibiotics chloramphenicol (chloromycetin®) and aureomycin are of basic theoretical interest because of their action against rickettsiae and many viruses. Activity against these obligate intracellular parasites led Lépine [1] and his associates of the Pasteur Institute, Paris, France, to test the effects of these antibiotics on the rate of proliferation of normal tissue cells. Explants from 11 to 15 day old chick embryos were cultivated on a plastic membrane in a liquid medium according to the Wirth [2] technic. Under these conditions the cells multiply to form a flat single layer consisting almost entirely of fibroblasts or epithelial cells. The liquid medium was changed on the third day and the amount of cell growth measured on the fifth day. The average of 10 to 15 duplicate measurements was taken as the coefficient of cell growth. Ten to 1,000 gammas per cubic centimeter of one antibiotic were added to the liquid medium and the resulting changes in the growth rate noted. In a typical case the coefficient of 63 was reduced to 48 by the addition of 10 gammas per cubic centimeter of aureomycin, and it was further reduced to 2 and 0 by the addition of 100 and 1,000 gammas of aureomycin per cubic centimeter, respectively. Histologic examinations showed numerous vacuoles and fatty degenerations. Cell death was noted in tissues subjected to the 1,000 gamma concentration. Similar histolytic effects were noted with chloramphenicol. The concentrations required to inhibit growth of embryonic tissue cells are within the range attained in the blood of treated patients, although it has been shown that patients with blood levels of chloramphenicol within these ranges for short intervals do not manifest toxic effects.[3] Assuming that adult and embryonic tissues are equally susceptible, the phenomenon described by the Paris investigators would be of practical clinical interest. It would be particularly applicable to patients who require repair of tissues or who are maintained on prolonged therapeutic regimens.

1. Lépine, P.; Barski, G., and Maurin, J.: Proc. Soc. Exper. Biol. & Med. **73**: 252 (Feb.) 1950.
2. Wirth, J., and Barski, G.: Ann. Inst. Pasteur **73**: 987, 1947. Barski, G., and Maurin, J.: Ann. Inst. Pasteur **74**: 312, 1948; **76**: 295, 1949.
3. Smadel, J. E.; Woodward, T. E.; Ley, H. L., Jr., and Lewthwaite, R.: J. Clin. Investigation **28**: 1196, 1949.

WASHINGTON NEWS

Blood Program

The National Security Resources Board will hold the first meeting of all organizations concerned with the national emergency blood program early in June. The A. M. A. delegate is Dr. Leonard W. Larson of Bismark, N. D.; his alternate is Dr. Herbert P. Ramsey of Washington, D. C. Both are members of A. M. A.'s House of Delegates. The meeting will be an initial step in integrating the blood programs of anticipated military and civilian needs in time of national emergency.

Meanwhile, the Defense Department has gone ahead, with NSRB approval, and adopted a program for determining blood supplies for military use. NSRB is thoroughly satisfied that the Defense Department program will fit in with the over-all blood needs and agrees that this part of the plan should be underway before the first meeting of all groups concerned. Dr. Richard Meiling, director of Defense Medical Services, will be in charge of the military side and work closely with civilian groups and government agencies in procuring and storing whole blood, plasma and plasma substitutes.

First steps in Defense Department's program will be to determine how much whole blood and plasma substitutes will be needed for combat and reserve and how much and what kind of transfusion equipment will be necessary. Defense has a $100,000 appropriation for fiscal 1951 for research on blood preservation and transfusion equipment.

Tuberculosis in Laboratory Workers

Dangers to laboratory workers from infection by tuberculosis germs are emphasized by both Public Health Service and the Army. Dr. A. G. Wedum, safety director for the Army's bacteriologic warfare center at Camp Detrick, Maryland, says new mixtures of the germs are infecting workers "right and left," because of their greater potency. Dr. Wedum discussed the situation in connection with a meeting of the Society of American Bacteriologists. He also displayed there, for the first time, an Army-produced film dealing with these dangers and effective safeguards. In a few months the society and the Armed Forces Institute of Pathology, Washington, D. C., will have prints of the film for use of medical societies and schools. Another film on the same subject is available now at the Public Health Service Communicable Disease Center, Atlanta, Ga. Public Health Reports (vol. 65, no. 14) takes up the problem of infection of laboratory workers with tuberculosis. It describes the problem as "grave" and says, "The hazards of accidental infection among laboratory workers are becoming a matter of constantly greater concern to laboratory directors." The article describes safety measures adopted at the Atlanta center.

Antihistamines

The Armed Forces Epidemiology Board has entered the public argument over effectiveness of antihistamines. In an official report, the board said it had decided, after "significant and intensive tests," that the drugs are without effect against true cases of common cold. The board says that in the tests potent prescription dosages as well as the over-the-counter drug store products were administered. However, the report did not cover allergic subjects suffering from what they thought to be colds. Persons with known allergies were eliminated from the group. A spokesman for the board said there was absolutely no important difference in reaction between the groups of subjects given antihistamines and a control group given pills of no potency. All had been infected with the common cold virus. The full report is being published in the *New England Journal of Medicine*.

In its fifth action against producers and sellers of antihistamines, the Federal Trade Commission has cited Grove Laboratories, Inc., of St. Louis. FTC charges the company with misrepresenting the therapeutic properties and effectiveness of Antimine in treatment of the common cold and disputes the safety of the product. In its complaint FTC notes that advertisements for this drug represent it as a cure, preventative and competent and effective treatment for the common cold. FTC says it has none of these properties.

Surplus Government Real Estate

Hospitals or medical colleges anxious to obtain cost free any particular piece of surplus government real estate may have their opportunity now. Regulations have been issued for disposal of certain unspecified real estate for educational and public health purposes. Recipient institutions must be prepared to assume immediate custody and maintenance and to agree to use the property only in accordance with a preapproved plan. Other requirements are that they must pay certain costs in connection with transfer of title and agree to make reports if called for by Federal Security Agency. Under the regulations, Public Health Service and the Office of Education (both in FSA) are required to give wide publicity to property coming under this classification and to handle negotiations for disposal. However, title rests with General Services Administration up to the time of transfer.

Pending Legislation

The outlook for several bills, theoretically approaching the enactment stage, still remains uncertain. Bills for federal assistance to local public health units, for assistance to medical education and for establishing a national school health program require only House passage, but all are controversial and the House is still bogged down by various other bills, including military. The Senate calendar is more crowded than that of the House. Senate leadership is committed to take up the Fair Employment Practices legislation passed early in the session by the House. Two other subjects are certain to stir up long and involved argument in the upper chamber: appropriations and the President's various reorganization plans.

Two groups of reorganization plans await action, with a deadline of next week for the first and early in July for the second. If neither house objects within the time limits, the reorganizations automatically go into effect.

One proposal in the second group, incidentally, would grant important new authority to W. Stuart Symington, chairman of the National Security Resources Board. The President proposes to give him powers which would give him rank second only to Defense Secretary Louis Johnson. He would be supreme adviser to the President in all phases of emergency mobilization planning, including direction of medical services.

Also, now that the House has finished with the omnibus appropriations bill, the Senate must go to work on this complicated piece of legislation. While the Senate probably will not get down to details on appropriations the way the House has, it will have to devote something like a month to this big money bill.

However, even the Senate's jammed-up calendar will not prevent a heated floor discussion of one bill of major importance to the medical profession: H. R. 6000, for extension of social security benefits and coverage. The Senate Finance Committee several weeks ago dropped out of H. R. 6000 the section on permanent and total disability, which has been objected to by A. M. A. witnesses. But this action was not sufficiently convincing to the administration leadership. The Democratic leader, Senator Scott Lucas of Illinois, and floor leader, Francis Myers of Pennsylvania, announced they would fight to have this section reinstated. Both are members of the Finance Committee (where they voted to approve the bill), but they disagree with the committee's decision that existing federal legislation gives sufficient protection to the handicapped.

ORGANIZATION SECTION

Official Notes

TOUR TO THE SAN FRANCISCO CONVENTION

International Travel Service, Palmer House, Chicago, is operating a de luxe first class convention tour to the A. M. A. Convention in San Francisco. This tour will leave Chicago Saturday, June 17, at 1 p. m. (C. S. T.) via the Milwaukee Road. Highlights of this tour are two nights at Banff Springs Hotel, motor tour to Lake Louise and Field, one night at Chateau Lake Louise, Vancouver, by steamer to Victoria and Seattle, overnight at the New Washington Hotel, motor to Portland, Columbia River Highway, San Francisco—the Convention City—Los Angeles, three nights at Los Angeles Ambassador Hotel, Dinner Dance in Coconut Grove, return via Grand Canyon, arrive Chicago July 7. Rates start at $397 plus tax, one to a lower berth. Reservations and descriptive literature may be secured from International Travel Service, Palmer House, Chicago, telephone FInancial 6-3750. Special arrangements may be made for those who wish to return directly from San Francisco.

NEW A. M. A. PUBLICATIONS

After three years of work, the eighteenth edition of the American Medical Association directory of physicians has been completed and copies are now being shipped to subscribers. The new directory contains 2,913 pages and lists information on 219,677 physicians in the United States, its dependencies and Canada. It also lists American graduates and licentiates located temporarily abroad. Since the 1942 directory, thousands of changes of address have been made, 51,984 names have been added and 28,242 names dropped from the book on account of death or for other reasons. The directory costs $25. Orders can be placed by writing to Frank V. Cargill, Directory Department, American Medical Association, 535 North Dearborn Street, Chicago (10).

Volume III of "Questions and Answers" is now available from the Order Department of the American Medical Association. This book sells for $3. This book contains answers to nearly 1,000 difficult questions asked by practicing physicians in the United States. Material was selected from the "Queries and Minor Notes" section appearing in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION during the last seven years.

State Legislation

Louisiana

Bills Introduced.—H. 115 proposes the creation of a Louisiana **Board of Chiropractic Examiners** and defines a chiropractor as one who shall employ objective or subjective means to ascertain the alinement of the vertebrae of the human spine, including the use of analytic instruments and x-ray for the purpose of anaylsis, and the practice of adjusting the vertebrae for the purpose of correcting interference with nerve transmission and expression. H. 123 proposes certain amendments to the law relating to the practice of **osteopathy** especially with reference to the qualifications of applicants and licenses by reciprocity. S. 26 proposes the creation in the Division of Administration of the office of **Commissioner of Hospitals** to coordinate the activities of the state-owned general charity hospitals, hospitals for the mentally ill and tuberculosis hospitals; to conduct investigations relative to such hospitals, and to perform such other duties that might be assigned to him. The Commissioner of Hospitals would be required to be a medical doctor duly authorized and licensed to practice in the state and to have had administrative experience in the operation of hospitals or in the field of public health. S. 56 proposes that the superintendents of all charity hospitals and other hospitals having contracts with the state of Louisiana for the **care and treatment of indigents** be authorized and directed to furnish to the doctor who refers the patient to such institution a report on such patient, showing the diagnosis, laboratory and x-ray findings and treatment prescribed, when such patient is discharged from such institution.

Massachusetts

Bill Enacted.—H. 2213 has become chapter 431 of the Laws of 1950. It provides that no **blood banks** shall be established and maintained in Massachusetts except by a hospital licensed by the department under the provisions of section 71 or by the American Red Cross.

New Jersey

Bill Enacted.—A. 311-A has become chapter 119 of the Laws of 1950. It fixes minimum qualifications for the licensing of **public health laboratory technicians.**

Rhode Island

Bill Enacted.—H. 790 was approved May 1, 1950. It provides regulations requiring corporations to engage registered or practical **nurses or first aid workers** for service in their plants depending on the number of employees in the corporation. The law also defines "Standing Orders" as meaning a written or printed compend of directions, outlining routine medical or nursing services and procedures, approved and signed by a licensed physician and acknowledged by him to be services and procedures which may, in his absence, be performed by a particular registered nurse or a particular practical nurse.

Coming Medical Meetings

American Medical Association, San Francisco, June 26-30. Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

American Association for the Surgery of Trauma, Salt Lake City, June 22-24. Dr. Charles G. Johnston, 1512 St. Antoine St., Detroit 26, Secretary.

American College of Chest Physicians, San Francisco, June 22-25. Mr. Murray Kornfeld, 500 N. Dearborn St., Chicago 10, Executive Secretary.

American College of Radiology, San Francisco, June 25. Mr. William C. Stronach, 20 N. Wacker Drive, Chicago 6, Executive Secretary.

American Dermatological Association, Jasper National Park, Alberta, Canada, June 18-22. Dr. Louis A. Brunsting, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Diabetes Association, San Francisco, Hotel Whitcomb, June 24-25. Dr. John A. Reed, 1 Nevins St., Brooklyn 17, Secretary.

American Hearing Society, Chicago, Drake Hotel, June 15-17. Mrs. Frances E. Lee, 817 Fourteenth St., N.W., Washington 5, D. C., Secretary.

American Heart Association, San Francisco, Fairmont Hotel, June 22-25. Dr. John J. Sampson, 1775 Broadway, New York 19, Secretary.

American Medical Women's Association, Carmel, Calif., June 20-22. Dr. Grace Talbott, 909 Hyde St., San Francisco 9, Secretary.

American Neurological Association, Atlantic City, Claridge Hotel, June 12-14. Dr. H. Houston Merritt, 710 W. 168th St., New York 32, Secretary.

American Proctologic Society, Los Angeles, July 1-5. Dr. W. Wendell Green, 1838 Parkwood Ave., Toledo 2, Ohio, Secretary.

American Society for the Study of Sterility, San Francisco, Sir Francis Drake Hotel, June 24-25. Dr. John O. Haman, 490 Post St., San Francisco 2, Secretary.

Association for the Study of Internal Secretions, San Francisco, June 23-24. Dr. Henry H. Turner, 1200 N. Walker St., Oklahoma City 3, Secretary.

Conference of Presidents and Other Officers of State Medical Associations, San Francisco, Palace Hotel, June 25. Mr. John E. Farrell, 106 Francis St., Providence, R. I., Secretary.

Maine Medical Association, Poland Spring, June 18-20. Dr. Frederick R. Carter, 142 High St., Portland 3, Secretary.

Medical Library Association, Boston, June 19-22. Miss Helen Hlavac, 209 East 23d St., New York 10, Secretary.

Minnesota State Medical Association, Duluth, June 12-14. Dr. B. B. Souster, 496 Lowry Medical Arts Bldg., St. Paul 2, Secretary.

Montana State Medical Association, Bozeman, Gallatin County High School, July 9-12. Dr. Herbert T. Caraway, 115 N. 28th St., Billings, Secretary.

Oklahoma State Medical Association, Oklahoma City, June 4-7. Dr. Lewis J. Moorman, 210 Plaza Court, Oklahoma City, Secretary.

Western Association of Industrial Physicians and Surgeons, San Francisco, June 25. Dr. Christopher Leggo, C. & H. Sugar Refining Corp., Crockett, Calif., Secretary.

West Virginia State Medical Association, White Sulphur Springs, The Greenbrier, July 27-29. Mr. Charles Lively, P. O. Box 1031, Charleston 24, Executive Secretary.

International Meetings

International Anatomical Congress, Oxford, England, July 25-28. Secretary, Miss A. M. Maynall, Department of Human Anatomy, University Museum, Oxford, England.

International Association for the Prevention of Blindness, London, England, July 17-21. Prof. P. Bailliart, 47 rue de Bellechasse, Paris, France, Chairman.

International Cancer Research Congress, Paris, France, July 17-22. Secretariat, 6 Ave. Marceau, Paris 8, France.

International Congress of Ophthalmology, London, England, July 17-21. Mr. Keith Lyle, 45 Lincoln's Inn Fields, London W.C.2, England, Secretary.

International Pediatric Congress, Zurich, Switzerland, July 24-28. Dr. L. Emmet Holt Jr., 477 First Ave., New York City 16, Secretary-General.

International Union Against Venereal Diseases, Zurich, Switzerland, July 29-Aug. 2. Dr. A. Cavaillon, Institut A. Fournier, 25 Blvd. St. Jacques, Paris 14em., France, Secretary.

PROGRAM OF THE AMERICAN MEDICAL ASSOCIATION FOR THE ADVANCEMENT OF MEDICINE AND PUBLIC HEALTH

A Federal Department of Health

1. Creation of a Federal Department of Health of Cabinet status with a Secretary who is a Doctor of Medicine, and the coordination and integration of all Federal health activities under this Department, except for the military activities of the medical services of the armed forces.

Medical Research

2. Promotion of medical research through a National Science Foundation with grants to private institutions which have facilities and personnel sufficient to carry on qualified research.

Voluntary Insurance

3. Further development and wider coverage by voluntary hospital and medical care plans to meet the costs of illness, with extension as rapidly as possible into rural areas. Aid through the states to the indigent and medically indigent by the utilization of voluntary hospital and medical care plans with local administration and local determination of needs.

Medical Care Authority with Consumer Representation

4. Establishment in each state of a medical care authority to receive and administer funds with proper representation of medical and consumer interest.

New Facilities

5. Encouragement of prompt development of diagnostic facilities, health centers and hospital services, locally originated, for rural and other areas in which the need can be shown and with local administration and control as provided by the National Hospital Survey and Construction Act or by suitable private agencies.

Public Health

6. Establishment of local public health units and services and incorporation in health centers and local public health units of such services as communicable disease control, vital statistics, environmental sanitation, control of venereal diseases, maternal and child hygiene and public health laboratory services. Remuneration of health officials commensurate with their responsibility.

Mental Hygiene

7. The development of a program of mental hygiene with aid to mental hygiene clinics in suitable areas.

Health Education

8. Health education programs administered through suitable state and local health and medical agencies to inform the people of the available facilities and of their own responsibilities in health care.

Chronic Diseases and the Aged

9. Provision of facilities for care and rehabilitation of the aged and those with chronic disease and various other groups not covered by existing proposals.

Veterans' Medical Care

10. Maintenance of existing high standards of medical care for veterans, including extension of facilities where the need can be shown and, where practicable, care of the veteran in his own community by a physician of his own choice.

Industrial Medicine

11. Greater emphasis on the program of industrial medicine, with increased safeguards against industrial hazards and prevention of accidents occurring on the highway, at home and on the farm.

Medical Education and Personnel

12. Adequate support with funds free from political control, domination and regulation of the medical, dental and nursing schools and other institutions necessary for the training of specialized personnel required in the provision and distribution of medical care.

GOVERNMENT SERVICES

ARMY

ANNUAL MEETING OF PSYCHOLOGY CONSULTANTS

The annual conference of consultants in clinical psychology to the Army Surgeon General was held in the Surgeon General's Office, Washington, D. C., May 8. Progress of the Army Medical Department's Clinical Psychology Program was reviewed and plans for the forthcoming year formulated. The consultants present were Wayne Dennis, Ph.D., University of Pittsburgh; William A. Hunt, Ph.D., Northwestern University; Carlyle F. Jacobsen, Ph.D., University of Iowa; James G. Miller, M.D., Ph.D., Chicago University, and David Shakow, Ph.D., University of Illinois. Representing the Surgeon General were Col. John M. Caldwell (MC), chief of the Psychiatry and Neurology Consultants Division; Col. Othmar F. Goriup (MSC), chief, Medical Service Corps; Lieut. Col. Charles S. Gersoni (MSC) and Major Jerome G. Sacks (MSC), chief and assistant chief, respectively, Clinical Psychology Branch, Psychiatry and Neurology Consultants Division.

CONSULTANTS TO VISIT EUROPEAN COMMAND

Drs. Ovid O. Meyer of the University of Wisconsin and S. Alan Challman of the University of Minnesota went to Europe May 10 as Army Medical Department consultants. They will spend about 30 days advising with Army surgeons. Dr. Meyer received his medical degree from Columbia University in 1926 and was certified in internal medicine in 1937. He is professor and chairman of the Department of Medicine of the University of Wisconsin. Dr. Challman received his medical degree from the University of Minnesota in 1930 and was certified by the American Board of Psychiatry and Neurology in 1939. He is associate clinical professor, Department of Psychiatry, University of Minnesota.

COURSE ON NUCLEAR ENERGY

A total of 293 students attended the course in the medical aspects of nuclear energy held at the Army Medical Center, Washington, D. C., May 8-13. The total included regular Army and Officers Reserve Corps 69; National Guard 43; reservists on active duty 103; Public Health Service 19; Air Force 35; Canadian officers 14, and civilians, including one foreign national, 10.

MONTHLY MEDICAL MEETING

Dr. Melvin A. Casberg, dean, St. Louis University School of Medicine, was guest speaker at the Surgeon General's monthly medical meeting, May 18, at the Army Medical Center, Washington, D. C. Dr. Casberg's subject was "Current Trends in Medical Education."

PERSONAL

Col. William S. Stone (MC) has been appointed commandant of the Army Medical Department Research and Graduate School, Washington, D. C. Colonel Stone's previous assignment was chairman of the Medical Research and Development Board in the Surgeon General's Office.

VETERANS ADMINISTRATION

TUBERCULOSIS AMONG VETERANS

Dr. Paul B. Magnuson, chief medical director of the Veterans Administration, recently stated that 33,830 service-connected and 11,233 non-service-connected cases of tuberculosis were on the VA compensation and pension rolls on Oct. 1, 1949. Each month there are 300 to 400 service-connected and 600 to 700 non-service-connected cases added to the list. As of Feb. 28, 1950 there were 13,065 tuberculous veterans hospitalized in VA beds, 2,109 hospitalized in non-VA beds and 2,379 on the waiting list, a total of 17,553. There are 3,408 patients in excess of the load estimated for 1950 by the Federal Board of Hospitalization in September 1945. Dr. Magnuson said that from present indications the peak tuberculosis hospital load would be about 20,000 in 1955; after that it probably would decline gradually until 1960 and then level off with a fairly steady load of 15,000 to 18,000 cases constantly hospitalized. He emphasized that these figures are estimates only and may require further revision.

DR. BARNWELL AWARDED THE TRUDEAU MEDAL

The National Tuberculosis Association has awarded the 1950 Trudeau medal to Dr. John B. Barnwell, chief of the Tuberculosis Division of the Veterans Administration Department of Medicine and Surgery. Under his direction, research on the treatment of tuberculosis has been carried on in 45 VA hospitals. Formerly he was associate professor and physician in charge of the Tuberculosis Unit at the University of Michigan School of Medicine, Ann Arbor. He is a past vice president and president of the American Trudeau Society.

PUBLIC HEALTH SERVICE

SCIENCE ATTACHÉ—A NEW POSITION

Dr. Arthur S. Osborne has been assigned as science attaché to the science staff of the American Embassy in London. Dr. Osborne is the first to hold the post of science attaché in an American embassy. The science staff was established in the London Office of the American Embassy in 1948 under the Fulbright Act. The program of the science staff includes the following activities: obtaining new scientific data, through exchange of views with British scientists, for dissemination among scientific and research organizations in the United States; preparation of reports and evaluation of current activities in particular branches of British science, for use by the State Department and other agencies of the U. S. government; furnishing advice on scientific matters to the embassy, and promoting "scientific good will" through discussions, seminars, lectures, laboratory demonstrations and interchange of scientific programs among American and British governmental and private science groups.

Dr. Osborne received a bachelor of science degree from Pennsylvania State University in 1929 and his M.B. and Ch.B. from the University of Glasgow, Scotland, in 1935. He served an internship at Samaritan Hospital, Brooklyn, and was commissioned a medical officer with the Royal Air Force in 1940. In 1942 he was commissioned in the Medical Corps of the American Air Force. In 1946 he entered the Public Health Service as a commissioned officer. He is a member of the Kings County Medical Society and the Royal Society of Medicine.

Medical News

(Physicians will confer a favor by sending for this department items of news of general interest: such as relate to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.)

ALABAMA

State Medical Election.—The Medical Association of the State of Alabama at its annual meeting elected Dr. Joseph M. Weldon, Mobile, as president and Dr. James O. Finney of Gadsden and Dr. Alfred J. Treherne, Atmore, vice presidents of divisions. Dr. Douglas L. Cannon, Montgomery, was reelected secretary-treasurer.

CALIFORNIA

Dr. Carson to Head Pediatrics Department.—Dr. Merl J. Carson, assistant professor of pediatrics and assistant dean of Washington University School of Medicine, St. Louis, has been appointed head of the department of pediatrics at the University of Southern California School of Medicine, Los Angeles. He will also direct the Los Angeles Children's Hospital, which is connected with the medical school. Dr. Carson is a graduate of Vanderbilt University School of Medicine, Nashville, 1938.

State Medical Election.—At the recent annual meeting of the California Medical Association, Dr. Donald Cass, Los Angeles, was installed as president. Dr. H. Gordon MacLean, Oakland, was chosen president-elect and Dr. Lewis A. Alesen, Los Angeles, was reelected speaker of the House of Delegates. Elected to the House of Delegates of the American Medical Association are Drs. H. Gordon MacLean, E. Vincent Askey, Los Angeles, and Dr. Dwight L. Wilbur of San Francisco; Dr. Donald Cass, Los Angeles; Dr. Ralph B. Eusden of Long Beach and Dr. R. Stanley Kneeshaw of San Jose.

CONNECTICUT

Yale Coordinates Microbiology Activities.—A new department of microbiology will be established July 1 at Yale University, New Haven, to coordinate the extensive research and teaching activities related to microbiology in progress in the various schools and departments at Yale. Henry P. Treffers, Ph.D., professor of microbiology and director of graduate studies of an interdepartmental program in microbiology in the school of medicine and graduate school, has been named chairman. With its new status, the department of microbiology can now operate in any school in the university and will include studies in bacteriology, immunology, virology, mycology, parasitology and tropical medicine. The present department of bacteriology will be reorganized as a section under microbiology.

IDAHO

Hospital News.—The new Caldwell Memorial Hospital in Caldwell was dedicated on April 16. Governor C. A. Robins was one of the principal speakers. The hospital cost $800,000 and contains 75 beds.

Public Health Meeting.—The eleventh annual meeting of the Idaho Public Health Association will be held at McCall June 5-6. The sessions will be conducted along workshop lines. Among the consultants assigned to each discussion group are Dr. Raymond L. White, Boise, chairman, Legislative Committee, Idaho State Medical Association; Dr. Robert S. McKean, chairman, Idaho Whitehouse Conference; Attorney General Robert E. Smylie and Dr. Edwin P. Peterson, Boise; Dr. Donald J. Soltman, Grangeville, and Roy Stephenson, superintendent, Idaho Falls, Latter-Day Saints' Hospital.

ILLINOIS

Society News.—The Society for Experimental Biology and Medicine, Illinois Section, held its last seasonal meeting at Michael Reese Hospital, Sarah Morris Amphitheater, May 23. The guest speaker was Dr. Maurice Stamler of the hospital, whose subject was "Pathogenesis of Arteriosclerosis." Nine papers were read.

Personal.—Ann Fox, secretary of the Educational Committee of the Illinois State Medical Society, on May 19 received the Mate E. Palmer Award of Merit of the Illinois Woman's Press Association for winning first place in the publicity section in the annual contest of the association. The award was given for the Health Talk titled "Try Laughing," one in a weekly service to the press of Illinois. Formerly, Miss Fox was for several years, news editor of THE JOURNAL.

Chicago

Society Election.—At the annual meeting of the Chicago Urological Society April 27 the following officers were elected: Drs. Herman M. Soloway, president; Frederick A. Lloyd, vice president, and Jacob S. Grove, secretary-treasurer.

Lecture on Nutrition.—At a luncheon meeting at the Milk Foundation June 22 at 11:45 a. m., Dr. George E. Wakerlin, retiring president of the foundation and head of the department of physiology, University of Illinois, will speak on the subject "Nutrition Problems in the United States Today."

Koessler Fellowship of the Institute of Medicine.—The Jessie Horton Koessler Fellowship of the Institute of Medicine of Chicago for the aid of research in biochemistry, physiology, bacteriology or pathology will be available on September 1. The stipend is $500 a year with the possibility of renewal for one or two years. Only those applications will be considered which are approved by the head of a department in the fields mentioned or by the director of a research institute or laboratory in Chicago and which stipulate that the recipient of the fellowship shall be given adequate facilities for carrying out the proposed research, concerning which full information is required in the application. Applications will be received up to July 1 and should be sent in quadruplicate to Dr. Paul R. Cannon, chairman, Committee on the Jessie Horton Koessler Fund, 950 East Fifty-Ninth Street, Chicago 37. Application should be made by letter.

KENTUCKY

Society News.—The annual dinner meeting of the Fayette County Medical Society on May 9 at the Boiling Springs Country Club, Lexington, was attended by more than 250 physicians including visitors from central Kentucky. Dr. Frederick T. Billings Jr., Vanderbilt University School of Medicine, Nashville, spoke on "ACTH and Cortisone."

State Journal Improvements.—In the May issue of the former *Kentucky Medical Journal* scientific articles are in a prominent position in the front section. Twenty-two members of the state association have been appointed as consultants to review all scientific material submitted for publication. Under "Editorial Comments" short statements on pertinent subjects and on editorials from other state medical journals will be listed. In the "Organization Section" activities of the state association and county societies as well as some of the proceedings of the American Medical Association will be reported. The "President's Page" will continue to be a monthly feature. A new cover page in color carrying the table of contents has been instituted, and the name has been changed to the *Journal of the Kentucky State Medical Association.*

LOUISIANA

Personal.—Dr. John L. Kron, New Orleans, is the recent recipient of the Thomas Jefferson School Award for school service during the past four years. He was cited for having treated hundreds of Jefferson pupils free of charge.

State Medical Election.—The Louisiana State Medical Society at its spring meeting installed Dr. George W. Wright of Monroe as president and elected Drs. Ulysses S. Hargrove, Baton Rouge, J. Kelly Stone, New Orleans, and H. Guy Riche Sr., Baton Rouge, first, second and third vice presidents, respectively. Dr. Paul T. Talbot, New Orleans, continues as secretary-treasurer.

MARYLAND

Dr. Perkins Heads Mental Hygiene Department.—Dr. Clifton T. Perkins, who for the past 12 years has been head of the Massachusetts Department of Mental Health, took over his duties June 1 as head of the Maryland Department of Mental Hygiene, succeeding Dr. George H. Preston, Baltimore, who retired in June 1949. He is a graduate of the Boston University School of Medicine (1926). The Maryland Department of Mental Hygiene has undergone reorganization and its budget for the operation of hospitals was substantially increased by the 1949 General Assembly.

New Environmental Medicine Department.—Dr. Joseph L. Lilienthal Jr. has been appointed professor of environmental medicine, a new department created at the Johns Hopkins University School of Hygiene and Public Health, Baltimore. Dr. Lilienthal, in addition to his new duties, will continue to be head of the physiologic division of the department of medicine at the Johns Hopkins Hospital and associate professor of medicine at the school of medicine. The new department will be concerned only with fundamental research. Anna Baetjer, D.Sc., assistant professor of environmental hygiene, will be the only other member of the new department for the present and will continue studies she has conducted for several years on the effects of certain types of dust in the development of pneumonia

and cancer. It is expected that new laboratories will be provided under the future building program. Dr. Lilienthal, a native of New York, received his medical degree from Johns Hopkins school of medicine in 1937. After serving his internship at Presbyterian Hospital in New York from 1938 to 1940, he served as assistant resident and resident physician at Johns Hopkins Hospital from 1940 to 1942. He returned to the university staff in 1946 after four years' service in the navy.

MINNESOTA

Dr. Wakim Visiting Professor at University of Syria.—Dr. Khalil G. Wakim, professor of physiology at the Mayo Foundation and Medical Research Consultant at the Mayo Clinic, Rochester, left in March for Syria to serve as a visiting professor at the National University of Syria at Damascus, and to assist in the reorganization of the medical school of the university under a three month grant awarded by the Department of State in cooperation with the Mayo Foundation and Clinic. This is the first grant awarded to a visiting professor under the exchange of persons program authorized for an assignment in the Eastern Hemisphere by the Smith-Mundt Act. Ultimate development of a school of public health for local training of Syrian Health Department workers is expected as an outgrowth of the project. Dr. Wakim was born in Sidon, Lebanon, and received his medical degree from the American University of Beirut School of Medicine, where he was an instructor in physiology for several years. In 1938 he came to the United States. While at the American University of Beirut, Dr. Wakim made a study for the British Government one summer on health conditions in rural Palestine and served for three summers as director of village welfare work. In 1936 he made a study of health conditions and practiced medicine among the nomadic tribes of the Arabian desert in the Kuneitra Area. In the United States he has served as visiting professor of physiology at the State University of Iowa College of Medicine, Iowa City. From 1941 to 1943 he was on the faculty of the Indiana University School of Medicine, Indianapolis. He is a consultant to the Surgeon General at the Army Medical Center on basic medical education.

NEW YORK

Postgraduate Instruction.—A postgraduate lecture has been arranged for the Warren County Medical Society to be given June 8 at 9 p. m. at the Queensbury Hotel, Glens Falls, by Dr. H. Pelham Glasier, Albany, on "Carcinoma of the Colon." The Geneva Academy of Medicine, meeting at the Belhurst in Geneva June 19 at 8:30 p. m., will hear Dr. Timothy J. Riordan, New York, speak on "The Treatment of Common Diseases of the Skin." This instruction is provided by the Medical Society of the State of New York with the cooperation of the New York State Department of Health.

Service in Mental Hygiene Department.—During the past few months the State Department of Mental Hygiene, for the first time, formally recognized the quarter-century or longer service of employees. The combined service of the 1,178 employees who qualified for awards totals 35,000 years. Employed mainly in the 27 institutions administered by the department, 712 have been on duty from 25 to 30 years, 370 from 30 to 40 years and 70 for more than 40 years. Employees who received the awards represent all grades in the civil service classification of personnel. Included are doctors, nurses and attendants, kitchen and laundry workers, clerical help, skilled workmen and laborers, cooks and bakers, maintenance men, institution police and firemen and others engaged in the administration and operation of the state hospitals and school of the mental hygiene system.

Training Center on Atomic Energy Development.—The University of Rochester on May 15 opened a new million dollar center, financed by the Atomic Energy Commission, for research and training of physicians and technicians in medical problems relative to atomic energy development. Attached to the University of Rochester School of Medicine and Dentistry, the center is planned to help meet the nation's need: (1) to train medical and staff personnel of the armed forces for atomic warfare defense; (2) to build up a nucleus of civilian medical personnel having a knowledge of atomic energy; (3) to supply a source of trained research scientists in the branches of medicine, biology, physics, biophysics, physiology, chemistry and biochemistry, in which the new technics of nuclear energy may be employed; and (4) to supply the necessary scientific personnel for the various regional laboratories of the A. E. C. The new facilities will permit expansion of the University of Rochester's studies for the U. S. Government in the medical and biologic aspects of radioactive substances which have been in progress for a number of years. Postgraduate training will be given in the treatment of radiation sickness, the use of radioisotopes for tracer studies and therapy and instruction in such subjects as pharmacology and toxicology of radioactive materials, principles of shielding, design of radiochemical laboratories, technic of personnel monitoring, hazards of reactor operation, prevention of radioactive contamination and methods of decontamination, and the disposal of radioactive waste materials. Cancer research will be permitted as part of the elective research open to trainees. Henry A. Blair, Ph.D., physiologist and biophysicist, is director of the A. E. C. project at Rochester, which began under the Manhattan District during World War II, when it was a center for research on the medical hazards of the atomic bomb development.

New York City

Grant to Study Facial Deformities.—A research grant of $52,379 to finance a two year study of the psychologic and sociologic aspects of facial deformities and plastic surgery by a team of scientists at the New York University-Bellevue Medical Center has been made by the National Institute of Mental Health. The project is being coordinated by Frances C. MacGregor, research associate in sociology, and is under the direction of Dr. John M. Converse, a faculty member of the department of surgery, New York University College of Medicine.

Dr. Rennie Appointed Professor of Psychiatry.—Dr. Thomas A. C. Rennie, attending psychiatrist of the Payne Whitney Psychiatric Clinic, New York Hospital, has been appointed professor of psychiatry (social psychiatry) at Cornell University Medical College. In addition, he is psychiatric consultant for the American Red Cross, consultant to the office of the Surgeon General, U. S. Public Health Service, director, Division of Rehabilitation, National Committee for Mental Hygiene, and member, committee on neuropsychiatry, National Research Council. Dr. Rennie was appointed associate professor of psychiatry at Cornell in 1941, in addition to the Payne Whitney affiliation. A native of Scotland, Dr. Rennie did undergraduate work at the University of Pittsburgh and received his medical degree from Harvard Medical School, Boston, in 1928.

NORTH CAROLINA

State Medical Election.—The Medical Society of the State of North Carolina at its May meeting installed Dr. Roscoe D. McMillan of Red Springs as president and Dr. Fred C. Hubbard of North Wilkesboro as president-elect. Dr. Millard D. Hill of Raleigh was elected secretary-treasurer in 1949 and serves through 1952.

University Promotions.—Dr. Robert B. Lawson, associate professor of pediatrics, has been promoted to professor of pediatrics and director of the department at Bowman Gray School of Medicine of Wake Forest College, Winston-Salem. Dr. Leroy J. Butler will retain the title of professor of pediatrics but has asked to be relieved of administrative duties. Dr. Eben Alexander Jr. has been promoted from instructor in surgery to assistant professor of surgery in charge of neurosurgery. Dr. George E. Bradford, formerly assistant in clinical otolaryngology, has been named assistant professor of otolaryngology.

OKLAHOMA

State Medical Meeting.—The Oklahoma State Medical Association will hold its annual meeting June 4-7 with headquarters in the Municipal Auditorium, Oklahoma City, under the presidency of Dr. George H. Garrison, Oklahoma City. Guest speakers are:

Joseph W. Gale, Madison, Wis., The Crippled Lung.
Albert N. Lemoine Jr., Kansas City, Mo., Differential Diagnosis of a Red Eye.
Vincent J. O'Conor, Chicago, Rupture of the Urethra and Bladder.
Curtis H. Tyrone, New Orleans, Endometriosis.
Kenneth E. Appel, Philadelphia, Gastrointestinal Function and Emotion.
Harry Shwachman, Boston, Use of New Antibiotics in Infancy and Childhood.
John S. Bouslog, Some Misconceptions of the Gastrointestinal Tract in Children.
Edgar Hull, New Orleans, Pitfalls in the Use of Precision Methods in Cardiac Diagnosis.
Robert R. Kierland, Rochester, Minn., Treatment of the Commoner Skin Diseases.
John S. Knight, Kansas City, Mo., Hoarseness: Voice Recording in Various Laryngeal Diseases.
Atha Thomas, Denver, Amputation—Surgical Principles and After-Care with Special Attention to Prosthetic Requirements.

A public television broadcast on poliomyelitis will take place Wednesday from 1:30 p. m. to 2:30 p. m. The president's dinner dance will be held Tuesday at 8 p. m. Both scientific and commercial exhibits will be shown. The Woman's Auxiliary will meet at the Skirvin Hotel.

PENNSYLVANIA

State Society's Five Year Postgraduate Program.—The fourth Graduate Education Institute series of lectures to begin this fall will inaugurate a five year program to include 20 special courses of 15 hours each in the 10 teaching centers. Two courses will be presented in the fall and two each spring. This new plan, while aimed to appeal to the general practitioner, will be less varied and more concentrated than the previous courses and will allow sufficient time for detailed consideration of certain subjects. Each day's session will consist of six hours of instruction divided equally between two different courses. The faculty will include lecturers obtained largely from the medical schools within the state. Any one holding an M.D. degree may register. The fee will be $25 for members of the Medical Society of the State of Pennsylvania or the American Medical Association. With the exception of veterans of World War II applying under the G. I. Bill of Rights, nonmembers are required to pay $50. A special fee of $15 will be charged for any single course. The courses for the five year program will include allergy, bone and joint diseases, cardiology, dermatology, endocrinology, gastroenterology, genitourinary diseases, gynecology, hematology, infectious diseases, interpretation of symptoms on a physiologic basis, metabolic diseases, neurology, obstetrics, parasitic diseases, peripheral vascular diseases, physical medicine and rehabilitation, psychiatry, pulmonary diseases and special senses, which include eye, ear, nose and throat.

The ten teaching centers will be located in Allentown, Clearfield, Harrisburg, Johnstown, Lancaster, Meadville, Reading, Washington, Wilkes-Barre and Williamsport. Scranton will alternate with Wilkes-Barre each year beginning in the fall of 1951. Permanent attendance records will be maintained. Information may be obtained by writing to the Commission on Graduate Education at 230 State Street, Harrisburg, Pa.

Philadelphia

The Packard Library.—The College of Physicians of Philadelphia will receive the medical library and lantern slides belonging to Dr. Francis Randolph Packard, throat specialist and medical historian. Dr. Packard, a past president of the college, died April 18.

Psychiatric Clinic for Juvenile Patients.—The School of Medicine and the Hospital of the University of Pennsylvania have established a psychiatric clinic for the treatment of juvenile patients with emotional disturbances. In the Clinic for Functional Diseases the new children's section will be staffed with five psychiatrists. They will strive for early detection and correction of maladjustments of childhood. Dr. Kenneth E. Appel, director of the clinic, said that it would also serve as a training center for instruction of interns and resident physicians. The work will be directed by Dr. Norman K. Nixon, who has been associated with the children's psychiatric clinics in New York City for the last three years.

WISCONSIN

Heart Association Meeting.—The annual meeting of the Wisconsin Heart Association will be held in Madison June 10. The all day program will feature scientific meetings at the State of Wisconsin General Hospital, Madison, and at the dinner program beginning at 6:30 at the Park Hotel. The speaker of the evening will be Dr. George E. Fahr, professor of medicine, University of Minnesota Medical School, Minneapolis. The afternoon program will include a clinical conference on four heart disease cases.

GENERAL

Catholic Physicians Luncheon.—A luncheon and meeting for Catholic physicians will be held at the Fairmont Hotel, San Francisco, June 28 at 12:30 p. m., sponsored by the Federation of Catholic Physicians' Guilds, St. Louis. Tickets may be purchased at the registration desk.

National Board Diplomates Meeting.—The Associated Diplomates of the National Board of Medical Examiners, now numbering over 20,000 in the United States, Canada and elsewhere, will hold their annual meeting at 4 p. m. June 28 at the Fairmont Hotel, San Francisco. The president is Dr. Willard O. Thompson and the secretary Dr. Paul S. Rhoads, both of Chicago.

Society for the Study of Sterility.—The Conference of the American Society for the Study of Sterility will be held at the Sir Francis Drake Hotel, San Francisco, June 24-25, under the presidency of Dr. Lyman W. Mason, Denver, Colo. Subjects for the Saturday program are Mammalian Aspects of Infertility and Gynetic Aspects of Infertility; the Sunday program, Basic Studies on the Role of the Male in Sterility, and Standards and Therapy in the Male. Registration is $10 and should be sent to the American Society for the Study of Sterility, 20 Magnolia Terrace, Springfield 3, Mass.

Medical Women's Meeting.—The American Medical Women's Association will hold its annual meeting at the Del Monte Lodge, Pebble Beach, Calif., June 20-22. The meeting will be a business and social one except for the Woolley Memorial Lecture on "Pathology of Prematurity," by Dr. Edith L. Potter, Chicago. The incoming officers of the association include Drs. Elizabeth S. Waugh, Philadelphia, president; Amey Chapell, Atlanta, Ga., president-elect; Mildred C. J. Pfeiffer, Philadelphia, corresponding secretary; Margaret H. Edwards, Pottsville, Pa., recording secretary, and Mary R. Noble, Bowmansdale, Pa., treasurer.

Hearing Society Meeting.—The National Conference of the American Hearing Society will be held in Chicago at the Drake Hotel, June 15-17. On the afternoon of June 15 there will be a symposium on industrial deafness with Dr. William E. Grove of Milwaukee, chairman of the subcommittee on Noise in Industry of the American Academy of Ophthalmology and Otolaryngology, acting as moderator. The following afternoon hearing conservation will be discussed. At the Thursday evening session Dr. Francis L. Lederer, head of the department of otolaryngology, University of Illinois College of Medicine, will act as moderator for a round table on "Hearing Problems from the Otologists' Point of View."

Christian Medical Society Meeting.—The national convention of this society will be held on the campus of the Northern Baptist Seminary, 3040 W. Washington Blvd., Chicago, June 16-18. The program includes:

Philip B. Marquart, Wheaton, Ill., Scriptural Concept of Psychotherapy.
Rudolph C. Logefeil, Minneapolis, Organization and Stimulation of Graduate Groups.
Galen G. Crozier, Bowling Green, Ohio, What Training Should Be Secured by the Missionary Candidate After Medical School and Internship?

On Saturday morning "The Christian Ministry of the Doctor" will be discussed, with Dr. Stanley D. Anderson, Waukegan, Ill., acting as chairman. Dr. Howard H. Hamlin, Chicago, will preside at the banquet Saturday evening at 6:30.

Dr. Koelle Wins Abel Prize.—At the Atlantic City meeting of the American Society for Pharmacology and Experimental Therapeutics George B. Koelle, Ph.D., Chalfont Fellow in Ophthalmology, Wilmer Institute, Johns Hopkins Medical School, Baltimore, was awarded the 1950 John J. Abel Prize in Pharmacology for his researches on the histochemical differentiation of types of cholinesterase and their localization in the tissues of the cat. This prize of $1,000 and a bronze medal has been donated to the American Society for Pharmacology and Experimental Therapeutics by the Eli Lilly Co., Indianapolis, for the purpose of stimulating fundamental research in pharmacology and experimental therapeutics by young investigators.

Symposium on Thin Films.—This symposium, sponsored by Armour Research Foundation of Illinois Institute of Technology, will be held June 8-10 at the Sheraton Hotel, Chicago. Some 200 scientists will discuss the formation, geometry, structure and applications of thin films. Accent will be on applications and thin film problems. Any attendant will be able to present his thin film problem June 9 or 10 to outstanding authorities in the field. The instrument display, which will form part of the symposium program, will show recent developments in instrumentation for phase microscopy and vacuum evaporating. A new, simplified table model electron microscope, Type EMT (RCA), employing permanent magnets will be on display. This instrument is designed to put the electron microscope within the reach of most laboratories, schools and industrial plants.

Fellowships for Research in Blood Diseases.—The Hematology Research Foundation invites applications for the Ruth Reader Fellowship, the Robert L. Goldblatt Fellowship and the Dr. Raphael Isaacs Fellowship for research in blood diseases in the academic year 1950-1951. The stipend for each fellowship is $1,500 per year with the option to renew. This offer is made to workers of any race, creed or color in the United States. Applications must be submitted no later than July 15 to the Hematology Research Foundation, 72 East 11th Street, Chicago 5. Application forms are available on request. Awards will be announced by the Medical Advisory Council either the latter part of July or early in August. The council will choose the applicants on the basis of merit, and they will also choose the institution in Chicago in which the work is to be done.

Society Elections.—At the annual meeting of the American Psychiatric Association held May 2-3 in Detroit the following officers were elected: Drs. John C. Whitehorn, Baltimore, president; Leo H. Bartemeier, Detroit, president-elect, and R. Finley Gayle Jr., Richmond, Va., secretary.——At the annual meeting of the New England Society of Physical Medicine held May 17 in Boston the following officers were elected: Dr. Sidney Licht, Boston, president; Dr. Manuel Kaufman, Boston, first vice president; Dr. Jacob L. Rudd, Boston, second vice president; Dr. David C. Ditmore, Boston, secretary; Dr. Howard Moore, Newton, treasurer, and Mary M. O'Connor, Arlington, executive secretary.——Officers elected at the spring meeting of the Atlantic Coast Line Railroad Surgeons Association include Dr. Frank A. Hoshal, Charleston, S. C., president; and Dr. Braswell E. Collins, Waycross, Ga., secretary-treasurer.

Marriages and Divorces Declining.—For the third consecutive year both marriages and divorces in the United States declined in 1949. The figures, compiled by the U. S. Public Health Service, show 1,585,440 marriages and an estimated 386,000 divorces in the United States in 1949. Since 1946, when both marriages and divorces were at the highest level in this country's history, marriages dropped 30.8 per cent and divorces 36.7 per cent. According to final figures, there were 1,811,155 marriages in the United States in 1948. The provisional total for 1949 is 12.5 per cent below that figure. The crude marriage rate for 1949 was 10.7 marriages per 1,000 population. This was the lowest since 1939 and was 13.7 per cent smaller than the revised rate for 1948 of 12.4 marriages per 1,000 population. The estimated total of 386,000 divorces for 1949 was 5.4 per cent below the final estimate for 1949 of 408,000 divorces. The crude divorce rate for 1949 was estimated at 2.6 per 1,000 population, compared with 2.8 divorces per 1,000 population in 1948.

First Quarter Mortality Rates Low.—Despite a widespread outbreak of influenza and pneumonia, the lowest first-quarter death rate on record for the two diseases was established in 1950, according to the experience among the industrial policyholders of the Metropolitan Life Insurance Company. The death rate was 23.2 per 100,000 as compared with 26.3 for the first three months of last year. The rates were 50 and 78.6, respectively, for the quarters of 1946 and 1944, the two most recent years when influenza was epidemic. New low first-quarter death rates were also recorded for tuberculosis, the principal communicable diseases of childhood as a group, syphilis, appendicitis, gastritis and the complications of pregnancy and childbirth. By contrast, slight increases, as compared with last year, were shown in the mortality from the diseases of the heart, arteries and kidneys, which account for about half of all the deaths among the policyholders, and in the mortality from cancer, which ranks second among the causes of death. An increase in motor vehicle accidents was counterbalanced by a decline in home and occupational mishaps to new low levels this year.

Communicable Disease Report.—According to the U. S. Public Health Service, reported incidence of whooping cough continued to increase for the week ended May 13 over the previous week, from 2,691 to 2,867 cases. The total for the corresponding week last year was 1,054 and the five year (1945-1949) median was 1,965. The cumulative total for the first 19 weeks of the year was 49,977, which may be compared with the corresponding total of 19,094 for the same period last year and 51,914 for 1947, the highest on record for the past five years. The corresponding five year median was 40,341. Reported incidence of tularemia increased from 17 for the previous week to 24 cases for the week ended May 13, the highest on record for the corresponding week in the last five years. For the first 19 weeks of the year the cumulative total was 387, which may be compared with 458 cases for the same period last year and 590, the highest on record for past five years. Arkansas reported 10 of the 24 cases for the week ended May 13, and Texas reported 4 cases. Reported cases of acute poliomyelitis in the nation increased from 72 cases the previous week to 102 cases for the week ended May 13. The total for the week included 28 cases in California (from 14 to 28) and 38 cases in Texas (from 28 to 38).

Establish Registry of Hepatic Pathology.—The American Gastroenterological Society has sponsored a registry of Hepatic Pathology at the American Registry of Pathology, a department of the Armed Forces Institute of Pathology, administered under the auspices of the National Research Council. The purpose of this registry is to collect liver specimens obtained by biopsy or autopsy accompanied with pertinent laboratory and clinical records. Contributions of unusually interesting material from experimental animals are also desired. This material will be available for research. The contributed material will be reviewed by the Armed Forces Institute of Pathology. Contributors will receive an opinion concerning the material submitted based on studies by the institute staff in association with a group of civilian consultant pathologists especially interested in hepatic pathology. Material for the registry should be submitted by or through a pathologist on forms obtained from the institute. Contribution of the material will in no way interfere with its publication by the contributor himself. Follow-up information on the submitted cases, as it becomes available, will be of great value in determining the course of disease and efficacy of treatment. In the case of liver biopsy specimens, it is requested that one stained and five unstained sections be supplied; in autopsy material one stained section and either paraffin blocks or wet tissues are requested and gross photographs of the liver, when available. It is essential that the fixative used be listed. The material should be sent to the Director, Armed Forces Institute of Pathology, Washington 25, D. C., Attention Registry of Hepatic Pathology.

Diabetes Association Meeting.—The annual meeting of the American Diabetes Association will be held at the Sir Francis Drake Hotel and the Hotel Whitcomb, San Francisco, June 24-25, under the presidency of Dr. Howard F. Root, Boston. At the joint scientific program with the Association for the Study of Internal Secretions at the Drake on Saturday, the following program will be presented:

Frank G. Young, D.Sc., Cambridge, England, Growth Hormone and Experimental Diabetes.
Jerome W. Conn, Ann Arbor, Mich., ACTH Diabetes in Man.
Peter H. Forsham, George W. Thorn, Thomas F. Frawley and Donald R. Wilson, Boston, Studies on Carbohydrate Metabolism in Adrenal Cortical Hypersecretion.
Leslie L. Bennett, Mr. John E. Whitney and Miss Constantine Glafkides, Berkeley, Calif., Modification of the Metabolic Effects of Pituitary Adrenocorticotropic Hormone and Growth Hormone by the Administration of a Diet High in Potassium Chloride.
Randall G. Sprague, Harold L. Mason, Ph.D., and Marschelle H. Power, Ph.D., Rochester, Minn., Observations on the Pathogenesis of Cushing's Syndrome.
Oscar M. Hechter, Ph.D., Robert P. Jacobsen, Ph.D., Roger W. Jeanloz, Ph.D., Mr. H. Levy, Gregory G. Pincus, Sc.D., and Mr. V. Schenker, Shrewsbury, Mass., Pathways of Corticosteroid Synthesis.
W. Stanley Hartroft, Toronto, Canada, Islets of Langerhans in Man Visualized by Phase Contrast Microscopy.
Elexious T. Bell, Minneapolis, Incidence and Forms of Vascular Disease in Diabetes.

At the Hotel Whitcomb Sunday the program will be:

Mary B. Olney, Berkeley, Calif., Practical Aspects of Juvenile Diabetic Clinic Management.
Joseph H. Crampton, Lester J. Palmer, Clarence D. Davis and William J. Steenrod Jr., Seattle, Pregnancy in the Diabetic.
Francis D. W. Lukens, Philadelphia, Possible Dangers of Hyperglycemia.
Maximillian Fabrykant and Benjamin I. Ashe, New York, Arteriovenous Distribution of Glucose in Spontaneous Hypoglycemia.
Frank G. Young, D.Sc., Cambridge, England, the Banting Memorial Lecture: Endocrine Approach to the Problem of Diabetes.
Edward S. West, Ph.D., Portland, Ore., Some Effects of Methylene Blue in Alloxan Diabetes.
Alexander Marble and Miss Rachel S. Leech, Boston, Total Hydrolyzable Cystine in Blood Serum in Diabetes.
John E. Howard, Baltimore, Some Observations and Thought on the Therapy of Diabetic Acidosis.
Helen E. Martin, Maxine Wertman and Peter Hillier, Los Angeles, Potassium Deficits in Diabetic Acidosis.
Charles A. Woerner, Louisville, Ky., Experimental Changes in Stainable Hepatic Fat.
Frank S. Perkin and collaborators, Detroit, Jet Injection of Insulin in Treatment of Diabetes Mellitus.
Edgar A. Haunz and Mr. D. C. Keranen, Grand Forks, N. D., Clinical Interpretation of Blood Sugar Values.
Julius Pomeranze and Henry G. Kunkel, New York, Serum Lipids in Diabetes Mellitus.

At the banquet Saturday an address will be given on "Art and Science" by Dr. Robert R. Newell, Stanford University, Calif.

Marriages

JAMES H. SHUMAKER, Seville, Ohio, to Miss Donna Margaret Bailey of San Marino, Calif., in Pasadena, recently.

ROY G. BROWN, Onawa, Iowa, to Miss Cherie Lou Veile of Harrison, Neb., at Crawford, Neb., March 5.

FLOYD BENJAMIN MERRITT, Iowa City, Iowa, to Miss Jacqueline Fitzgerald of Rolling Ridge, in April.

EDMUND LUDLOW KEENEY, La Jolla, Calif., to Mrs. Esther Wight Penniman of Baltimore, March 14.

HAROLD J. PEGGS JR. to Miss Lola Elizabeth Conrad, both of Des Moines, March 26.

DONALD D. HOYTT to Miss Marjorie Morton, both of Los Angeles, recently.

Deaths

Harry Friedenwald ✦ emeritus professor of ophthalmology at the University of Maryland School of Medicine and College of Physicians and Surgeons of Baltimore, died at his home in Baltimore April 8, aged 85, of heart disease. Dr. Friedenwald was born in Baltimore Sept. 21, 1864. He graduated from Johns Hopkins University in 1884 and received his medical degree from the College of Physicians and Surgeons in Baltimore in 1886. During the next two years he did postgraduate work in Vienna and in Berlin. In 1890 he returned to this country and in 1894 became associate professor of ophthalmology and otology at the College of Physicians and Surgeons in Baltimore; in 1902 he succeeded his father as professor. When this medical school was absorbed into the University of Maryland, he continued as professor of ophthalmology until 1929, when he became emeritus. In 1907 and 1908 he was a member of the House of Delegates of the American Medical Association and in 1931-1932 chairman of the Section on Ophthalmology. He was a specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology. He was a member of the American Ophthalmological Society (president, 1937), a member of the American Academy of Ophthalmology and Otolaryngology, American Otological Society and the Association for Research in Ophthalmology. He was an honorary fellow of the Jewish Academy of Arts and Sciences and a fellow of the American Association for the Advancement of Science and the American College of Surgeons. In 1930 he gave the honorary Doyne lecture at the Oxford Ophthalmological Congress and in 1941 delivered the fourth annual de Schweinitz Lecture before the Section on Ophthalmology of the College of Physicians of Philadelphia. He was ophthalmic surgeon to the Baltimore Eye, Ear and Throat, Charity, Mercy, Sinai and Union Memorial hospitals and the Hospital for Women. In 1932 he received the honorary degrees of doctor of Hebrew letters from the Jewish Institute of Religion in New York and the honorary doctor of science from the University of Maryland. He was president of the Hebrew Educational Society and the Federation of Jewish Charities, a member of the board of governors of Dropsie College in Philadelphia, and president of the Federation of American Zionists from 1904 to 1912. He was also chairman of the medical advisory board of Hadassah and director of the Jewish Theological Seminary of America. Dr. Friedenwald was the author of "Jewish luminaries in medical history and a catalog of works bearing on the subject of Jews and medicine from his library" in 1946. A collector of rare manuscripts on medicine and valuable autographs, Dr. Friedenwald had presented his collection to a university in Palestine.

Francis Randolph Packard ✦ Philadelphia; born in Philadelphia, March 23, 1870; University of Pennsylvania Department of Medicine, Philadelphia, 1892; specialist certified by the American Board of Otolaryngology; at one time professor of otology at the University of Pennsylvania Postgraduate School of Medicine; veteran of the Spanish-American War and World War I; in 1931 president of the American Laryngological Association, which in 1942 bestowed on him its Newcomb Award; past president of the College of Physicians of Philadelphia, Library Company of Philadelphia and the American Otological Society; member of the American Philosophical Society and the American Laryngological, Rhinological and Otological Society; in 1931 delivered the fifth Weir Mitchell Oration before the College of Physicians of Philadelphia, in 1932 the William Potter Memorial Lecture at Jefferson Medical College and the Osler Oration at the meeting of the Canadian Medical Association and the Ontario Medical Association in Toronto; author of "History of Medicine in the United States," first edition in 1901 and second edition in 1919, "Diseases of the Ear, Nose and Throat" (1909), "School of Salerno" (1920), "Life and Times of Ambroise Paré" (1921) and "Some Account of the Pennsylvania Hospital"; in 1915 editor of "Gold Headed Cane"; editor of *Annals of Medical History* from 1917 to 1942; in 1939 received an honorary LL.D. degree from the University of Pennsylvania; affiliated with Pennsylvania Hospital, where he died April 18, aged 80.

Elliott Miley Hendricks ✦ Fort Lauderdale, Fla.; born in Cincinnati, July 9, 1897; University of Cincinnati College of Medicine, 1922; specialist certified by the American Board of Radiology; member of the Radiological Society of North America and the American Association of Industrial Physicians and Surgeons; fellow of the American College of Radiology; charter member of the Florida Radiological Society, of which he has been vice president and secretary; honorary member of the Broward County Medical Association; served during World War I; member of the Selective Service Board during World War II; formerly associated with the U. S. Public Health Service; affiliated with Broward General Hospital, of which he was a founder; radiologist at White Cross Hospital, Mount Carmel Hospital and the Franklin County Tuberculosis Hospital in Columbus, Ohio, 1924-1925, and superintendent of Edwards Hospital in Fort Lauderdale in 1926 and 1927; vice president of the First Federal Savings and Loan Association; died February 28, aged 52, of myocardial infarction.

Walter Melville Pamphilon, New York; born in Toronto, Ont., Canada, June 12, 1897; University of Toronto Faculty of Medicine, 1922; member of the American Psychiatric Association; past president of the Seneca County Medical Society; served in the British Navy during World War I; joined the state service at Buffalo State Hospital on July 7, 1923 and resigned in 1928 to serve as neuropsychiatrist with the Buffalo Regional Office, U. S. Veterans Bureau; reinstated at Buffalo State Hospital a year later; subsequently served at Manhattan and Willard State hospitals; acting medical inspector, on leave from his post as assistant director of Willard, when named assistant commissioner of the state department of mental hygiene; died March 29, aged 52, of acute coronary thrombosis.

John Franklin Hassig ✦ Kansas City, Kan.; born in Galena, Ill., Feb. 21, 1875; College of Physicians and Surgeons, Medical Department, Kansas City University, Kansas City, 1899; secretary and past president of the Kansas State Board of Medical Registration and Examination; past president and secretary of the Kansas Medical Society; served as president and vice president of the Federation of State Medical Boards; fellow of the American College of Surgeons; affiliated with St. Margaret's, Bethany and Providence hospitals; surgeon, Southern and Chicago, Rock Island and Pacific railway companies; died in St. Margaret's Hospital April 13, aged 75, of embolism.

Clarence A. Hartley Sr., Evansville, Ind.; born in 1873; George Washington University School of Medicine, Washington, D. C., 1907; member of the American Medical Association; honorary member of the board of directors of the Vanderburgh County Tuberculosis Association; served as health officer of Evansville and Vanderburgh County; emeritus member of the staff of Deaconess Hospital; served on the staffs of St. Mary's and Welborn Baptist hospitals; a founder of Boehne Tuberculosis Hospital; died April 7, aged 76, of coronary thrombosis.

John Light Atlee ✦ Lancaster, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1900; member of the American Association for the Surgery of Trauma; fellow of the American College of Surgeons; a trustee of Franklin and Marshall College; affiliated with the Lancaster General Hospital; formerly medical director of St. Joseph's Hospital; died in Jefferson Hospital April 3, aged 74, of carcinoma of the esophagus.

William Boyd Baker, Cumberland, Md.; Medical College of the State of South Carolina, Charleston, 1914; served overseas during World War I; medical examiner for the Baltimore and Ohio Railroad; died March 12, aged 61.

Samuel Barclay ✦ New York; L.R.C.P. and L.R.C.S. of Edinburgh and L.R.F. of P. & S., Glasgow, Scotland, 1940; attached to the medical corps of the British Army during World War II, served in the Middle East and North Africa, taking part in the invasion of Italy; affiliated with Morrisania City Hospital and the Bronx Eye and Ear Infirmary; died March 26, aged 36, of coronary thrombosis.

Claud Douglas Barkley ✦ State Line, Miss.; Atlanta School of Medicine, 1913; served during World War I; died in Laurel March 7, aged 58.

William Henry Betz, Bellevue, Neb.; Omaha Medical College, 1900; served during World War I; in 1932 received the local American Legion award for "outstanding service to the community over a period of more than 30 years"; died March 6, aged 82.

Henry Renick Brown ✦ Chillicothe, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; for many years member of the city board of health; served during World War I; affiliated with Mount Logan Sanatorium and Chillicothe Hospital; died April 4, aged 71, of coronary thrombosis.

James Hollis Crowley, Providence, R. I.; Tufts College Medical School, Boston, 1938; member of the American Medical Association; died April 3, aged 40, of heart disease.

Eleanor McNair Hutchinson Decker, Toledo, Iowa; Drake University College of Medicine, Des Moines, 1913; affiliated with the State Juvenile Home Hospital; died in Tama April 3, aged 71, of coronary heart disease and arteriosclerosis.

✦ Indicates Fellow of the American Medical Association.

Joseph Deutsch, Cleveland; Western Reserve University School of Medicine, Cleveland, 1920; died March 8, aged 58.

Edward Oliver Elmer, Hartford, Conn.; College of Physicians and Surgeons, Baltimore, 1894; member of the American Medical Association; served on the staff of Hartford Hospital; died in West Hartford April 3, aged 82, of coronary thrombosis.

Charles C. Emerson, St. Louis; St. Louis College of Physicians and Surgeons, 1903; died March 13, aged 76.

Preston Wiley Fishbaugh, Mendon, Ohio; College of Physicians and Surgeons, Baltimore, 1893; served on the school board; formerly affiliated with Gibbons Hospital in Celina, Van Wert (Ohio) Hospital and Lima Memorial Hospital in Lima; died March 25, aged 86, of arteriosclerosis.

Charles Biglow Frisbie ✦ Portland, Ore.; Rush Medical College, Chicago, 1901; at one time on the faculty of Drake University College of Medicine, Des Moines; affiliated with Portland Sanitarium; died March 29, aged 74, of pneumonia following an accident.

Allen Gilbert Gantt, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1901; died March 14, aged 83.

Sarah Garrett-Bangsberg, La Crosse, Wis.; Woman's Medical College of Pennsylvania, Philadelphia, 1911; member of the American Medical Association; for many years dean of women and school physician at the La Crosse State Teachers College; died April 1, aged 74, of cerebral hemorrhage.

John J. Gibson, Alexandria, Ind.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1893; member of the American Medical Association; affiliated with St. John's Hickey Memorial Hospital in Anderson; died March 24, aged 84, of cerebral hemorrhage.

Charles Fitzgerald Goltry, Russell, Iowa; National Medical University, Chicago, 1907; Bennett College of Eclectic Medicine and Surgery, Chicago, 1908; member of the American Medical Association; died in Chariton March 12, aged 87.

Frederic Lloyd Grover, Hartland, Wis.; Marquette University School of Medicine, Milwaukee, 1925; member of the American Medical Association; past president and served as secretary of the Waukesha County Medical Society; village health officer; affiliated with the Waukesha (Wis.) Memorial Hospital; died April 1, aged 51, of cerebral hemorrhage.

Wilbur Claire Hafford, Waycross, Ga.; University of Louisville (Ky.) School of Medicine, 1911; member of the American Medical Association; past president of the Ware County Medical Society; affiliated with Ware County Hospital, where he died February 26, aged 63, of pulmonary embolism.

Charles Lloyd Harsha ✦ Canonsburg, Pa.; Jefferson Medical College of Philadelphia, 1903; member of the House of Delegates of the American Medical Association in 1922; on the staff of the Canonsburg General Hospital; died March 20, aged 74, of pulmonary carcinoma.

Nathaniel Stretcher Hires, Salem, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1894; died in Ivy Hall Sanitarium in Bridgeton March 13, aged 79, of cardiovascular renal disease.

James P. Hitt, Tunica, Miss.; Memphis (Tenn.) Hospital Medical College, 1890; member of the American Medical Association; past president of the Sixth District Medical Association; died March 12, aged 89.

William Peter Hombach, Council Bluffs, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; member of the American Medical Association; for many years on the staff of Mercy Hospital; died March 15, aged 87.

John Ewing Hughart, Hilton Village, Va.; University College of Medicine, Richmond, 1904; died March 31, aged 75.

Byron Merle Hutchings, Terre Haute, Ind.; Medical College of Indiana, Indianapolis, 1903; member of the American Medical Association; fellow of the American College of Surgeons; affiliated with St. Anthony's Hospital; died in Culver Hospital, Crawfordsville, April 5, aged 70, of cirrhosis of the liver.

John Fay Hyde ✦ Omaha; University of Nebraska College of Medicine, Omaha, 1907; affiliated with the Nebraska Methodist Hospital, where he died March 23, aged 65, of cerebral hemorrhage.

Harry Demuth Jackson ✦ Circleville, Ohio; Starling-Ohio Medical College, Columbus, 1911; president of the Pickaway County Medical Society; served during World Wars I and II; member of the board of directors of Berger Hospital; died March 23, aged 67, of heart disease.

Ishmael W. Johnson, Stanton, Ky.; Hospital College of Medicine, Louisville, 1901; died in the Winchester Convalescent Home in Winchester March 14, aged 75, of uremia and diabetes mellitus.

Clem H. Jones, Galena, Kan. (licensed in Kansas in 1901); member of the American Medical Association; died March 29, aged 84, of chronic nephritis and heart disease.

Richard Kittle, Cleveland; Cleveland Medical College, 1896; died February 18, aged 82, of coronary and cerebral thrombosis.

Paul Howard Kleinhans ✦ Bethlehem, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1912; affiliated with St. Luke's Hospital, where he died April 4, aged 61, of hypertension.

Joseph Eugene Larochelle, Manchester, N. H.; Laval University Faculty of Medicine, Quebec, Canada, 1896; member of the American Medical Association; fellow of the American College of Surgeons; affiliated with Notre Dame de Lourdes Hospital in Manchester and the Hillsborough County General Hospital, Grasmere; died April 3, aged 78, of cerebral thrombosis and arteriosclerosis.

Edward King Lawrence, Hiawatha, Kan.; Lincoln (Neb.) Medical College of Cotner University, 1903; member of the American Medical Association; veteran of the Spanish-American War and World Wars I and II; died in the Horton (Kan.) Hospital February 21, aged 68, of cerebral hemorrhage.

Gerald Hastings McMahon, Detroit; Detroit College of Medicine, 1909; formerly vice president and in 1939 president of the International Association of Police and Fire Surgeons; for many years medical officer for the city fire department; on the staffs of St. Mary's and Harper hospitals; died March 30, aged 65, of cerebral hemorrhage.

Daniel William Miller ✦ Blackwell, Okla.; Kansas City (Mo.) Homeopathic Medical College, 1901; past president of the Oklahoma State Board of Medical Examiners; on the staff of Blackwell Hospital; deid February 26, aged 82.

Albert Perley Norris ✦ Cambridge, Mass.; Harvard Medical School, Boston, 1903; formerly milk inspector and medical inspector of the board of health for the city of Cambridge; died March 29, aged 75, of arteriosclerosis.

James Hinton Pennington ✦ Dodge City, Kan.; Emory University School of Medicine, Atlanta, Ga., 1923; member of the Kentucky State Medical Association; died in St. Anthony's Hospital March 8, aged 49, of acute myocardial failure.

William A. Ray, Portsmouth, Ohio; Medical College of Ohio, Cincinnati, 1897; member of the American Medical Association, American Heart Association and the Hempstead Academy of Medicine; affiliated with Schirrman and the Portsmouth General hospitals; died March 23, aged 77, of heart disease.

William Rigelhaupt ✦ Cleveland; Western Reserve University Medical Department, Cleveland, 1911; a trustee of the Cleveland Medical Library; affiliated with Lutheran Hospital, where he died April 9, aged 68, of cerebral hemorrhage.

Edward John Scannell, East Andover, N. H.; Dartmouth Medical School, Hanover, N. H., 1901; veteran of the Spanish-American War and World War I; died April 11, aged 74, of Hodgkin's disease.

Jesse David Schwartz ✦ New York; Cornell University Medical College, New York, 1910; served on the staffs of the Hospital for Joint Diseases, Mount Sinai Hospital and Jewish Memorial Hospital; died April 8, aged 62, of coronary thrombosis, cerebral hemorrhage and diabetes mellitus.

Daniel Webster Shumaker, Dover, Ohio; Ohio Medical University, Columbus, 1898; member of the American Medical Association; fellow of the American College of Surgeons; affiliated with Union Hospital; died in Grant Hospital, Columbus, March 28, aged 80, of acute posterior myocardial infarction.

Charles C. Slaughter, Kansas City, Mo.; Kansas City College of Medicine and Surgery, 1921; died in Butler March 27, aged 63, of paralysis and nephritis.

Jesse Glen Smith, Sioux Falls, S. D.; University of Louisville (Ky.) School of Medicine, 1943; served during World War II; member of the American Medical Association; died recently, aged 40, of Hodgkin's disease.

Orrick E. Smith, St. Louis; Marion-Sims College of Medicine, St. Louis, 1891; died March 31, aged 84.

John Samuel Stults, Altus, Okla.; Missouri Medical College, St. Louis, 1894; member of the American Medical Association; died in Jackson County Memorial Hospital March 9, aged 85, of carcinoma of the colon.

Foreign Letters

SWEDEN

(From a Regular Correspondent)

STOCKHOLM, April 14, 1950.

Decreasing Pneumonia Mortality

Dr. Gunnar Berg has published in the *Journal of the Swedish Medical Association* some statistical research under the heading "Can the Effect of Chemotherapy and Antibiotics be Deduced from the Official Statistics of the Mortality from Pneumonia?" He notes that modern chemotherapy for pneumonia began tentatively in 1937 in Sweden, but it was not until 1939 that this treatment received general application. Penicillin and other antibiotics could be expected to influence the pneumonia mortality only from 1944. The period chosen for this investigation was 1931-1946, the year 1931 being chosen as the starting point as it was in this year that certain changes were made in Sweden in the nomenclature of the causes of death.

Dr. Berg has used two methods of calculation. One, which he prefers, consists of comparing the number of deaths from pneumonia with the total number of deaths from all known causes. According to the other method, a count is made of all the deaths from pneumonia every year per 100,000 population. Dr. Berg is aware of the pitfalls inherent in such a study and points out that many other factors than the specific treatment given may have played an important part in decreasing the pneumonia mortality with such impressive effect in the period under review. The incidence of pneumonia, fluctuations in the virulence of the offending germs and changes in the powers of resistance to them in the human body may all have played an important part. But the sustained fall in the pneumonia mortality over so many years must, he holds, surely reflect, to some extent at any rate, the influence of modern treatment. He concludes, "The mortality is now hardly more than half what it was in the beginning of the 1930's."

Austrian Doctors to Sweden

The proposal that the present shortage of doctors in Sweden should be alleviated by the importation of Austrian doctors—already referred to in these columns—is frowned on by various scientific bodies such as faculties of medicine. A memorandum on the subject from the Faculty of Medicine of Uppsala emphasizes that whatever Austria can spare of its surplus doctors cannot be expected to represent the best of the profession. If some 200 Austrian doctors are added to some 350 foreign doctors already in Sweden, more than 10 per cent of the medical profession in Sweden would be foreigners. As for the present shortage of doctors in Swedish asylums, it has been suggested that the law of supply and demand should be obeyed by improving the conditions under which asylum doctors work. There are not enough of them simply because the housing and remuneration offered them are inadequate, and to rush foreign doctors into this service is to dodge the major issue of its administration. In Denmark there is a surplus of doctors at the moment; they would encounter fewer linguistic difficulties, as Danish and Swedish languages are somewhat similar.

Various other official bodies are also rather unreceptive. It is reported that the proposed importation of Austrian doctors is only part of the major issue, which is the socialization of medicine in Sweden—the creation of a state medical service with doctors acting as the whole-time servants of the state instead of being relatively independent members of the community. The Swedish Medical Association is often the target for abuse in the lay press on account of the measures it takes to safeguard the best interests of the medical profession. Dr. Stig Holm, writing in a recent number of the *Journal of the Swedish Medical Association* on the subject of the importation of foreign doctors, voices the opinions of many of his colleagues when he writes that the present so-called shortage of doctors is more apparent than real and is a reflection of unsatisfactory remuneration, housing and conditions of work for certain groups of doctors. He also deplores a policy of taxation which diminishes the output of work and the growing bureaucracy, which entails waste of effort. In his opinion, only one year's output of Swedish doctors is needed to fill the present gap in the medical profession.

A Swedish Museum for the History of Medicine

Speaking at a meeting of the Swedish Medical Association last December, Dr. Olaf Sjöqvist traced the somewhat sporadic efforts which have been made in Sweden since 1908 to create a Swedish museum of the history of medicine. At present there are more than 10,000 exhibits stored away in different buildings, and the Swedish Medical Association alone is in possession of some 7,000 such exhibits. There is also the priceless collection of instruments belonging to the Serafimer Hospital. The Serafimer Hospital, or part of it, has been suggested as a place for a museum with a qualified curator.

Societas Medica Scandinavica

The recent creation of Societas Medica Scandinavica reflects the need for a central organization to act as a clearing house for various medical problems in the Scandinavian countries. The sponsors of this new body have put on its program the following items: (1) educational problems and the exchange of students and teachers, (2) scientific activities, (3) preventive medicine, (4) hospital problems and exchange of doctors, (5) medical publications and (6) a library and film service. The headquarters of this organization may be in Gothenburg.

BELGIUM

(From a Regular Correspondent)

LIÉGE, April 14, 1950.

Brachialgia and Disk Hernia

Ectors pointed out to the Belgian Society of Neurology that of 144 cases in which disk hernia had caused only a root syndrome, without compression of the spinal medulla or of the cauda equina, and which were operated on, there were only 4 in which the hernia involved the cervical region; in the remaining 140 cases the herniation involved a lumbar intervertebral disk. Intervertebral disk herniation of the cervical region differs from that of the lumbar region in that in the former the nerve roots pass out horizontally, and the cervical part of the spinal column does not participate in the movements of the upper extremities, while the lumbar part of the spinal column plays a preponderant role in the movements of the lower extremities.

Music in the Sanatorium

In an article recently published in *Le Scalpel*, Toussaint reports the results of the treatment of tuberculosis at the Waterloo Sanatorium. In spite of the therapeutic interventions and the chemotherapeutic discoveries, the treatment is still based on prolonged rest of body and mind. Experience shows that the mental condition of the patient must not be neglected; if left to himself, he runs the risk of becoming depressed and of suffering spiritual and moral damage. Music seems particularly useful in the cure of tuberculous patients during the periods of fatigue and weakness. During this time

the patient can scarcely read or talk, and it seems that music would be an easy language, addressed more to his imaginative and emotional being than to his mind, which remains still definitely depressed by the sickness. Music, by occupying the patient's mind, will help the physician to canalize an intellectual and emotional activity which remains without object for too many hours.

The author believes that classical music should be given a place beside literature and should be distributed through libraries, since such entertainment is of considerable value for patients kept totally inactive for five or six hours daily.

National Conference on Social Service

The second National Conference on Social Service was held under the chairmanship of Dr. René Sand, who was one of the first to study rehabilitation of the sick and disabled in Belgium. Numerous reports were made on the subject by specialists, who stressed the necessity of integrating the various aspects of medical therapeutics during convalescence. Many methods of treatment ought not to be used successively but should be integrated as a whole. Physical therapy, rehabilitation, occupational readaptation must be planned and put into action during convalescence.

Dr. Lebrun summarized the results of the efforts made toward rapid rehabilitation of those injured in industrial accidents and mentioned his studies on work therapy for cardiac patients. He cited a series of occupations which on first sight may seem suitable for cardiac patients but in reality, because of the nervous tension involved, are tiring. He then dealt with the proper posture of workers in certain occupations and mentioned seats specially designed for watchmakers, who often have heart disease late in life because of the particular posture they adopt during their work.

Dr. Michotte, chief of the service for rheumatic diseases at Sainte-Elisabeth, who demonstrated the necessity of rehabilitation for rheumatic patients, stressed that, statistically, rheumatism incapacitates many persons and that their rehabilitation is of primary importance. He also suggested that the supervision and reeducation of children with acute articular rheumatism ought to be extended for at least three years.

Dr. L. Konings stressed the need of extending retraining not only to those with impaired locomotion but also to the sick. A great number of circulatory diseases, respiratory ailments, nervous disorders, diseases of the locomotor apparatus and occupational diseases are also amenable to reeducation. However, they create more complex problems. They require therapeutic centers with special personnel and complicated and specialized equipment. For this reason, work therapy shops should be attached to hospitals or university centers rather than to factories.

The conclusions of this reunion were summed up by Minister Troclet, who explained the mechanism of the legal provisions which guarantee to the disabled the right of gaining their livelihood on an equal basis with normal persons. He expressed his confidence in the medical problem of rehabilitation and stressed the necessity of providing occupation for the period between the discharge from the hospital and entrance into a workshop for apprenticeship.

Occupational Asbestosis

At the Belgian Society of Industrial Medicine, Clerens reported on his experience in the medical supervision of workers exposed to asbestos dust. His report includes the counting and measuring of dust, the investigations on asbestos particles in sputum and the functional roentgenologic and electrocardiographic examination of workers. He presents a statistical report of 75 subjects selected among workers most exposed to the inhalation of dangerous dusts. He encountered among these 70 normal subjects, 4 doubtful ones and 1 with pulmonary asbestosis. He concludes that in the fiber cement industry, radiologic pictures of pulmonary asbestosis as presented in classic descriptions are absent. The picture presented is more like that of fibrous bilateral pulmonary tuberculosis. The author supports this opinion with radiologic and anatomicopathologic records.

BRAZIL

(From a Regular Correspondent)

SÃO PAULO, April 21, 1950.

Germicidal Efficiency of Antiseptic Agents

A study of germicidal efficiency of antiseptic agents was performed by Drs. Salomão Chaib and Humberto Cerrutti in the Hospital N. S. Aparecida of São Paulo.

After their researches they concluded in part:

The human skin normally has bacteria on it, and these bacteria and the percentage of their occurrence, are:

Coagulase negative, nonhemolytic Staphylococcus albus	80
Bacillus subtilis	70
Nonhemolytic Staphylococcus aureus	25
Nonhemolytic Streptococcus	20
Coagulase-negative, hemolytic Staphylococcus	20
Coagulase-positive, hemolytic Staphylococcus albus	15
Coagulase-positive, hemolytic Staphylococcus aureus	5
Escherichia coli	5

Although most of the bacteria are nonpathogenic, coagulase-positive micrococci are frequent, indicating that strict control of antisepsis is necessary.

Nerve Compression and Paresthesias

To explain why ischemia produced by compression at the proximal part of the forearm or at the wrist does not cause sensory disturbances identical to those observed in compression at the upper arm, several experiments were made by Dr. Eros Erhart of the Anatomical Department of the Medical School of São Paulo. The method used was essentially that of Lewis and Pochin. Circulation was blocked at different levels of the limb by application of a pressure of 200 mm. of mercury with a sphygmomanometer cuff; compression of the median, ulnar and tibial nerve trunks was made with the aid of a small cushion under the cuff.

All experiments showed that, in addition to causing ischemia, the nerve compression increases the paresthetic effects of the release pricking. In this respect the results of Dr. Eros Erhart differ somewhat from those of other investigators, including those recently published by Merrington and Nathan.

Concerning the field of origin of the paresthesia, his results seem to corroborate Lewis' hypothesis that the ischemic and postischemic conditions of the nerve trunk are responsible for such paresthesias. His experiments showed, however, that compression of the nerve itself adds to the ischemic condition and increases the paresthesia, in the cutaneous field of the compressed nerve.

Regarding the mechanism of the paresthesias, he must admit with Weddell that the several mechanical conditions at the different levels of the limbs have great importance in determining different paresthesias, caused by proximal or distal blocking. However, he observed that it is not the mechanical action on the blood vessels, as Weddell admits, but the mechanical effect on the nerve trunk itself that determines the typical ischemic and postischemic paresthesias, as shown by his results.

Correspondence

BOTTLE FEEDING

To the Editor:—Dr. Philip C. Jeans in his excellent summary on the "Feeding of Healthy Infants and Children" (J. A. M. A. **142**:810 [March 18] 1950) makes a statement to which I take exception. He writes, "The continuance of bottle feeding after the first year is not good feeding practice and is usually evidence that other environment factors are faulty."

I believe that this expression if taken literally might result in psychologically undesirable attitudes in the management of infants. Dr. Jeans omits mention of a fundamental aspect of growth and development, with which I know he is familiar. Babies mature both physically and psychologically in a more or less constant pattern but at a pace which, within normal limits, varies with each baby. It is obvious that the sucking needs of well managed, undisturbed babies vary greatly. Some infants show a willingness to give up sucking at an age as early as 7 or 8 months. Others with no faulty environmental factors cling avidly to their bottles until well into the second year. This is especially true of the bedtime bottle.

Dr. Jeans' statement without modification might be interpreted as meaning that either a baby should be off his bottle at a year or else he is being poorly handled. Some babies easily and readily give up their bottles at 15 months, whereas it would seem that at 1 year no power on earth could accomplish this end. Forceful weaning earlier might have been deeply disturbing to the infant. Some babies become fretful and sleep poorly. Many, with still unsatisfied sucking needs, substitute the thumb for the nipple from which they have been separated and suck in this manner for a long time to come. Others stubbornly refuse milk and continue to do so for many years. The psychologic trauma of this frustration has deeper personality implications, of which psychiatrists are well aware.

ALFRED S. SCHWARTZ, M.D., St. Louis.

ASTHMA

To the Editor:—Dr. Piness's discussion of Dr. Rackemann's paper, "Other Factors Besides Allergy in Asthma" (J. A. M. A. **142**:534 [Feb. 25] 1950), deserves further emphasis in view of the fact that the latter's concept of intrinsic asthma is widely shared by leading allergists and has resulted in confusion. How vaguely this syndrome is defined is indicated by the fact that the term was first adopted to indicate asthma with negative skin reactivity, which is observed in about 50 per cent of all asthmatic patients (Rackemann, F. M.: *J. Lab. & Clin. Med.* **12**:1185, 1927). Cohen (Ann. Int. Med. **20**:590 [April] 1944) considered intrinsic asthma a disease with such a serious prognosis that treating it would be a waste of the physician's time and the patient's money. Rackemann on the other hand, notes in his present publication, that his patients recover. His basis of distinguishing intrinsic from extrinsic asthma is "age above 40." Some clinicians carelessly label as "intrinsic" allergic asthma associated with infection, because this is a common complication of allergic asthma in older persons and because infection tends to reduce the patient's ability to exhibit positive skin reactions. Others hold that intrinsic asthma is due to causes originating inside the system, in contradistinction to asthma from extraneous causes, such as pollen or food. Yet, it is doubtful that there are cases of asthma originating exclusively from one group of causes. Some authors reporting cases or statistics on intrinsic asthma demonstrate their awareness of this fact when speaking of a "borderline" group embracing the bulk of their cases, which they term "the intrinsic-extrinsic" type or "the extrinsic-intrinsic" type. It has recently become customary to link intrinsic asthma with the production of histamine within the system and with Selye's alarm reaction. However, no one has ever presented evidence that these features are characteristic of "intrinsic" asthma.

In a thorough search of 1,442 cases of bronchial asthma (*Ann. Int. Med.* **26**:863 [June] 1947), reference to which is usually avoided by the proponents of intrinsic asthma, I failed to find a single patient whose case would fulfil the criteria of this syndrome as established by Rackemann or by Cohen; nor was I able to find a single detailed case report in the literature of intrinsic asthma, the diagnosis of which would stand up under careful scrutiny.

There is asthma from bacterial and fungous infection, from endocrine and thermic sources; there is a congenital tendency to emphysema and to cystic lungs, and there are many other pulmonary diseases in which wheezing is a cardinal symptom. They are constantly dumped into the melting pot of intrinsic asthma. This greatly hampers the understanding of asthma. Furthermore, I know of cases in which it has actually led to disaster.

GEORGE L. WALDBOTT, M.D., Detroit.

Medical Motion Pictures

FILM REVIEW

Journey Back. (Edward Lundquist—Hemiplegic). 16 mm., black and white, sound, showing time 27 minutes. Prepared and produced in 1949 by the Department of Medicine and Surgery, Veterans Administration. Procurable on loan from Chief, Medical Illustration Division, Research and Education Service, Veterans Administration, Washington, D. C.

The picture tells the story of rehabilitation of a hemiplegic patient from the time he enters the hospital until the time of his discharge. The psychologic problems of the patient and of his wife are considered at some length, and the steps required for rehabilitation of this patient physically, mentally, socially and vocationally are well outlined. The patient undergoes medical examination, neurologic examination and personality tests and physical treatment (passive exercise, then active movement) and finally is transferred to the rehabilitation service for more extensive physical therapy, proper corrective exercise and motivation toward recovery. Speech therapy appropriately is stressed. It shows how the patient progresses to the point where he takes his first steps, learns balance and coordination and self care and finally achieves the ability to walk again. Various recreational programs which aid in the motivation of the patient are described. The patient's and his wife's fears that he cannot return to activity are finally overcome, and vocational guidance finally prepares him for return to active citizenship in a new vocation which is compatible with his residual physical disability. It is concluded that of 88 patients having hemiplegia who received treatment under this rehabilitation program, 60 achieved from 85 to 100 per cent self care; others showed lesser percentages of improvement, and only 6 showed little or no improvement.

The acting is overdramatized at one or two points, but on the whole the presentation is clear and convincing. Good rehabilitation in any general hospital is a task which must be performed by a team of physicians including primarily the specialist in physical medicine, the neurologist and the orthopedist and often the neurosurgeon, the urologist, the internist and a number of other medical specialists. The film is an excellent one and should be viewed by every physician who is interested in the rehabilitation of seriously disabled persons and specifically in the problem of the rehabilitation of the patient having hemiplegia. The photography and sound recording are of good quality, and the script is well arranged.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Various locations, June 19-21. *Part III.* Twenty-nine centers, June 6-29. Registration closes on May 6. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th Street, Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various locations, July 21. *Oral.* Chicago, Oct. 8-11. Sec., Dr. Curtiss B. Hickcox, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: *Written.* Various locations, Sept. 14. *Oral.* Detroit, Oct. 20-22. Sec., Dr. George M. Lewis, 66 East 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* San Francisco, June 21-23. The oral examinations in the subspecialties will be held at the same time and places. *Written.* Oct. 16. Asst. Sec., Dr. William A. Werrell, 1 West Main Street, Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, Oct. 1950. Applications no longer accepted. Sec., Dr. W. J. German, 789 Howard Ave., New Haven, Conn.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various Centers, January 1951. Final date for filing applications is July 1, 1950. Chicago, Oct. 2-6; West Coast, Jan. 1951. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part II.* Chicago, Jan. 25-26. Final date for filing applications is Aug. 15, 1950. Sec., Dr. Harold A. Sofield, 122 South Michigan Avenue, Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, October. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: St. Louis, Oct. 13-14. Sec., Dr. Robert R. Moore, 507 Euclid Ave., St. Louis 10.

AMERICAN BOARD OF PEDIATRCS: *Written.* San Francisco, June 30-July 2. *Oral.* Chicago, Oct. 13-15 and Boston, Dec. 1-3. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Oral and Written.* Boston, Aug. 26-27. Final date for filing applications is April 1. Sec., Dr. Robert L. Bennett, 30 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PLASTIC SURGERY: *Oral.* May-June. Sec., Dr. Louis T. Byars, 4647 Pershing Avenue, St. Louis, Mo.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: San Francisco, June 23-24. Applications no longer accepted. Next examination, December 1950. Final date for filing applications is Sept. 1.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Chicago, week of June 18. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, Oct. 25. Final date for filing applications is July 1. Sec., Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 10-14, 1951. Final date for filing applications is Sept. 1, 1950. Sec., Dr. Harry Culver, 7935 Sunnyside Road, Minneapolis 21.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 27-29. Sec., Dr. D. G. Gill, 519 Dexter Avenue, Montgomery.

ALASKA: * Juneau, Sept. 5. Special examinations given on application. Sec., Dr. W. M. Whitehead, Box 140, Juneau.

ARKANSAS: * *Examination.* Little Rock, June 8-9. Sec., Dr. Joe Verser, Harrisburg. Homeopathic. Little Rock, June and November. Sec., Dr. Carl S. Bungart, 105 N. 14th St., Fort Smith. *Eclectic.* Little Rock, June 8-9. Sec., Dr. Clarence H. Young, 1415 Main Street, Little Rock.

CALIFORNIA: *Examination, Written.* San Francisco, June 19-22; Los Angeles, Aug. 21-24; Sacramento, Oct. 16-19. *Examination, Oral and Clinical for Foreign Medical School Graduates.* San Francisco, June 18; Los Angeles, Aug. 20; San Francisco, Nov. 12. *Reciprocity, Oral Examination.* San Francisco, June 17; Los Angeles, Aug. 19; San Francisco, Nov. 11. Sec., Dr. Frederick N. Scatena, 1020 N Street, Sacramento 14.

CONNECTICUT: * *Examination.* Hartford, July 11-12. Sec. to the Board, Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, July 11-12. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Examination.* Dover, July 11-13. *Reciprocity.* Dover, July 20. Sec., Dr. J. S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 25-27. Sec. Dr. Frank D. Gray, 12 N. Rosalind Avenue, Orlando.

GEORGIA: *Examination.* Atlanta and Augusta, June. *Endorsement.* Atlanta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

HAWAII: *Examination.* Honolulu. July 10-13. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, July 10. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

ILLINOIS: Chicago, June 13-15. Superintendent of Registration, Mr. Charles F. Kervin, Capitol Building, Springfield.

INDIANA: *Examination.* Indianapolis, June. Sec., Dr. Paul R. Tindall, 1120 K. of P. Bldg., Indianapolis.

IOWA: * *Examination.* Iowa City, June 12-14. Sec., Dr. M. A. Royal, 506 Fleming Building, Des Moines 19.

KANSAS: Kansas City, June 7-8. Sec., Dr. J. F. Hassig, 905 N. 7th Street, Kansas City.

KENTUCKY: *Examination.* Louisville, June 14-16. Sec., Dr. Bruce Underwood, 620 S. 3rd Street, Louisville 2.

LOUISIANA: New Orleans, June 8-10. Sec., Dr. Roy B. Harrison, 1307 Hibernia Bank Bldg., New Orleans.

MAINE: *Examination and Reciprocity.* Augusta, July 11-12. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Examination.* Baltimore, June 20-23. Sec. Dr. Lewis P. Gundry, 1215 Cathedral Street, Baltimore 1. *Homeopathic.* Baltimore, June 20-21. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: *Examination.* Boston, July 11-14. Sec., Dr. George L. Schadt, Room 37, State House, Boston 33.

MICHIGAN: * *Examination.* Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA: * *Written. Special Examination,* Minneapolis, June 13-15. *Regular Examination,* Minneapolis, June 20-22. Sec., Dr. J. F. Du Bois, 230 Lowry Medcal Arts Building, St. Paul 2.

MISSISSIPPI: Jackson, June 20-21. Asst. Sec., Dr. R. N. Whitfield, Jackson 113.

MISSOURI: *Examination.* St. Louis, June 7-9. Exec. Sec., Mr. John A. Hailey, Box 4, State Capitol Building, Jefferson City.

NEBRASKA: * *Examination.* Omaha, June 5-7. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Building, Lincoln 9.

NEVADA: *Endorsement.* Carson City, August 7. Sec., Dr. George H. Ross, 112 Curry Street, Carson City.

NEW HAMPSHIRE: Concord, Sept. 13. Sec., Dr. John Samuel Wheeler, 107 State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 20-23 Sec., Dr. E. S. Hallinger, 28 West State Street, Trenton

NEW MEXICO: * Santa Fe, Oct. 9-10. Sec., Dr. Charles J. McGoey, Coronado Building, Santa Fe.

NEW YORK: *Examination.* Albany, Buffalo, New York and Syracuse, June 27-30. Sec., Dr. Jacob L. Lochner, Jr., 23 S. Pearl St., Albany.

NORTH CAROLINA: *Written.* Raleigh, June 19-22. *Endorsement.* Raleigh, June 19. Sec., Dr. Ivan Procter, 226 Hillsboro Street, Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, July 5-7. *Reciprocity.* Grand Forks, July 8. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Examination.* Columbus, June 14-17. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

OKLAHOMA: * *Examination.* Oklahoma City, June 7-8. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

OREGON: * Portland, July 6-8. Sec., Mr. Howard I. Bobbitt, 609 Failing Building, Portland.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, July 11-14. Act. Sec., Mrs. Marguerite G. Steiner, 351 Education Bldg., Harrisburg.

PUERTO RICO: *Examination.* Santurce, Sept. 5. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

RHODE ISLAND: * *Examination.* Providence, July 6-7. Sec., Mr. Thomas B. Casey, 366 State Office Building, Providence.

SOUTH CAROLINA: *Examination.* Columbia, June 26-29. *Reciprocity.* First Monday of each month. Sec., Dr. N. B. Heyward, 1329 Blanding Street, Columbia.

SOUTH DAKOTA: * Sioux Falls, July 18-19. Sec., Dr. C. E. Sherwood, 300 First National Bank Bldg., Sioux Falls.

TENNESSEE: * *Examination.* Nashville, June 6-7. Sec., Dr. H. W. Qualls, 1635 Exchange Building, Memphis.

TEXAS: * *Examination.* Austin, June 19-21. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Examination.* Salt Lake City, June. Dir., Dr. Frank E. Lees, 324 State Capitol Building, Salt Lake City

VERMONT: *Examination.* Burlington, June 13-15. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: *Examination.* Richmond, June 23-24. *Endorsement.* Richmond, June 22. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

WEST VIRGINIA: *Examination.* Charleston, July 10-12. Sec., Dr. N. H. Dyer, Capitol Bldg., Charleston .

WISCONSIN: * Milwaukee, July 11-13. Sec., Dr. C. A. Dawson, River Falls.

WYOMING: *Examination.* Cheyenne, June 5. Sec., Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.

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* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: *Examination.* Juneau, last week in August. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

ARIZONA: *Examination.* Tucson, June 20. Sec., Mr. Francis A. Roy, Science Hall, University of Arizona, Tucson.

COLORADO: *Examination.* Denver, Sept. 13-14. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 3.

CONNECTICUT. *Examination.* New Haven, June 10. Exec. Asst., State Board of Healing Arts, M. G. Reynolds, 110 Whitney Ave., New Haven.

FLORIDA: *Examination.* Gainesville, June 3. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

IOWA: *Examination.* Des Moines, July 11. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MICHIGAN: *Examination.* Ann Arbor, Oct. 13-14. Sec., Miss Eloise LeBeau, 101 North Walnut Street, Lansing 15.

MINNESOTA: *Examination.* Minneapolis, June 6-7. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: *Examination.* Omaha, Oct. 3-4. Director, Mr. Oscar F. Humble, Room 1009, State Capitol Building, Lincoln 9.

OKLAHOMA: *Examination.* Oklahoma City, Sept. 15. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

OREGON: Portland, June 17. Sec., Dr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: *Examination.* Providence, August 9. Chief, Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Building, Providence.

TEXAS: *Examination.* Austin, October. Sec., Brother Raphael Wilson, 306 Nalle Building, Austin.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Libel and Slander: Physician Must Be Legally Authorized to Practice.—The plaintiff sued for damages alleged to have been caused by the publication by the defendant of a libelous article. The case was heard in the United States district court, western division, North Carolina.

The plaintiff alleged that the following article appeared concerning him in the May 15, 1948 issue of Collier's magazine:

> In Swain County, North Carolina, mountain people swear by old Dr. Crawford, who can tell you what ails you the moment he pokes his nose through the door—and sniffs. For Dr. Crawford diagnoses entirely by his sense of smell. Each disease, he finds, has its own peculiar odor; and after smelling it out, he has only to sniff at his medicine bottle to mix together just the right dose.
>
> For several years now, North Carolina law has required the licensing of physicians. But Dr. Crawford is one of the old-time country doctors who practice under the Grandfather Clause, which permits any physician acknowledged by the local community to practice there for the rest of his life.

The plaintiff, said the district court, put his entire lawsuit in the physician's kit, since it is made to appear that he is wholly relying on the defamation of his professional standing as a physician in the community in which he lives. He alleges no special damage but proceeds entirely and wholly on the defamation being libelous per se. Since such is his manner of choosing, it becomes necessary under the evidence to determine whether the plaintiff, as he alleges, is a duly licensed and registered physician in North Carolina.

The court then discussed the history of the medical practice act with its amendments from the first act in 1858 to 1921. During that period all the versions of the medical practice act contained a "grandfather clause," permitting physicians to practice if they were practicing medicine and surgery in the state prior to March 7, 1885. In 1921 a new chapter was written into the statutory law with respect to the practice of medicine which provided that physicians who have a diploma from a regular medical college and were practicing medicine and surgery in the state prior to March 7, 1885 and who were properly registered as required by law would be permitted to practice in the state. That law also provided that any person desiring to engage in the practice of medicine or surgery should personally appear before the clerk of the superior court of the county in which he resides or practices for registration as a physician or surgeon.

The plaintiff in his evidence testified that he was born in Clay County, N. C., on June 22, 1866 and that in 1883, when he was 17 years of age, he began working with a Dr. Moore, who at that time was practicing medicine in Clay County, and that he continued in such work until Dr. Moore left Clay County and returned to his native state of Louisiana, which the plaintiff believes was in the year 1887. The plaintiff's evidence tends to show from his admissions that he was never licensed in the sense that he took an examination before the examiners of the Medical Society of North Carolina. He further makes an admission that he has never held a diploma from a recognized medical college and that he at no time undertook to register as a physician and surgeon or either or both under certain sections of the statutory law with the clerk of the superior court of any of the counties of North Carolina until Aug. 27, 1929, when he on that day presented himself before the clerks of the superior court of Cherokee county and of Macon county and that subsequently, on Oct. 23, 1930, he made a similar appearance before the clerk of the superior court of Graham County and undertook to do a like thing in registering before him for practicing in that county—these registrations apparently coming about after the plaintiff's conviction in a court of record on Jan. 14, 1929 for practicing medicine without a license in Jackson County, N. C. The plaintiff's purported registration in 1929 was apparently eight years or more after the repeal of the statute, assuming that he otherwise would be entitled to register as having practiced prior to March 7, 1885. The plaintiff, therefore, said the district court, can in no sense qualify as a physician and surgeon, and, therefore, any defamatory article published of and concerning him in his professional standing would obviously fail since he is lacking in that particular qualification.

The statements complained of in this action become libelous, said the court, only when they can be classified as relating to one who is authorized to engage in the practice of medicine at the time of the alleged publication and could not be in law injurious to one who is not a physician or surgeon. A publication which relates solely to the professional conduct of a person engaged in the practice of medicine is not actionable if such person is not legally entitled to practice the profession of medicine. Accordingly the defendant's motion for a directed verdict was granted and the plaintiff's cause of action was dismissed.—*Crawford v. Crowell-Collier Pub. Co., 87 F. Supp. 509 (N. C., 1949).*

Malpractice: Statute of Limitations in Damage Suit Due to Roentgen Burns.—The plaintiff sued the defendant physician for damages alleged to have been caused by the defendant's malpractice. From a judgment in favor of the physician, the plaintiff appealed to the Supreme Court of Oregon.

The plaintiff alleged that the defendant was a licensed physician and surgeon who held himself out as a specialist in x-ray diagnosis and therapy and that she employed him in his capacity as a specialist to treat a uterine tumor with which it was believed she was inflicted. On Jan. 11, 1937, the defendant subjected the plaintiff to roentgen therapy, in the course of which, said the plaintiff, he exposed a portion of her body to roentgen rays in a manner so careless, negligent and unskilful as to burn severely certain of her internal organs. From that time, Jan. 11, 1937, until Aug. 21, 1946, the plaintiff was under the constant care of other physicians and surgeons, who gave her many physical examinations and various kinds of medical treatment. On Aug. 21, 1946, one of them performed an abdominal operation on the plaintiff and then, for the first time, the plaintiff learned "that she never had a uterine tumor and that her said condition was the proximate result of the defendant's negligence, carelessness and unskilfulness aforesaid." The defendant demurred to the complaint on the ground that the action had not been instituted within the time permitted by law.

The action, being based on the alleged negligent performance by the defendant of his contract with the plaintiff, sounds in tort, said the Supreme Court, and the two year statute of limitations is applicable. The general rule in such cases is that the statute of limitations begins to run against the cause of action at the time when the act or omission constituting the alleged malpractice takes place. This rule has been criticized, however, said the Supreme Court. Even with no lack of diligence, it is possible that the patient may not, within two years after the commission of the tort, become aware of the physician's negligence or of the resultant injury. In fact, in some jurisdictions, including Oregon, in cases where the malpractice consisted of negligent acts or omissions extending throughout the whole course of treatment of the patient by the physician, the courts have to some extent mitigated the harshness of the rule of strict application of the statute of limitations by holding that the negligence is in the nature of a continuing tort and that the statute does not begin to run until the termination of the treatment. In the instant case, however, said the Supreme Court, no continuous treatment was involved. The defendant subjected the plaintiff to roentgen ray therapy on one day only, Jan. 11, 1937, and gave her no further treatment or professional advice. Her cause of action, therefore, accrued Jan. 11, 1937. The statute of limitations commenced to run on that day, and the period of limitation expired Jan. 12, 1939. The present action was not commenced until July 2, 1948, or more than nine years after the cause had been barred by the statute.

The counsel for the plaintiff argued that the court should ignore precedent and determine the question presented by the appeal on broad considerations of justice. But the constitutional authority of a court of law is limited to the interpretation and enforcement of the law as it is written, said the Supreme Court. Moreover, broad considerations of justice require that there should be statutes of repose to prevent the presentation of stale claims and discourage the assertion of fraudulent ones. The statute of limitations is a statute of repose, designed to protect the citizens from stale and vexatious claims and to make an end to the possibility of litigation after the lapse of a reasonable period of time. Such protection is especially necessary in cases such as this, said the Supreme Court. The physician and surgeon often are handicapped in their defense, because of the mute appeal that is made to the sympathies of jurors by the pitiable conditions of plaintiffs in many malpractice cases. For obvious reasons, they should not be further handicapped by having to combat stale claims. The statute was passed because of the uncertainty of the results attending the treatment of disease in the first place and the increasing difficulty of tracing such results as time goes on. Age, inherited traits, latent diseases and debilitated conditions sometimes render the most skilful treatment unavailing. Accordingly the Supreme Court held that the trial court was right in sustaining the defendant's demurrer and the judgment in favor of the physician was accordingly affirmed.—*Wilder v. Haworth, 213 P. (2d) 797 (Ore., 1950).*

Malpractice: Physicians Failure To Use Sterile Instruments.—This was an action for damages for personal injuries resulting from the alleged negligence of the defendant physician. From a judgment in favor of the physician an appeal was taken to the district court of appeal, second district, division 3, California, which reversed the judgment in favor of the physician *(Moore v. Belt,* 203 P. (2d) 22; J.A.M.A. **140:** 1354 [April 27] 1949). A further appeal was then taken to the Supreme Court of California.

The facts are fully stated in the abstract of the decision of the court of appeal. Briefly, however, it appears that the plaintiff submitted to a cystoscopy in the defendant's office and was told that the results of the examination were entirely normal. A few days later a rather severe infection of the urinary passages arose. The plaintiff produced an expert witness, whose opinion it was that the infection was introduced into the plaintiff's body by unsterile instruments or by failure to properly cleanse the edges of the urinary channels. The defendant's expert witnesses testified concerning standards of treatment and sterilization methods and stated that in their opinion the infection was not caused by any unsterile preparatory procedure nor introduced from outside sources in the conduct of the cystoscopic examination but, based on the prior medical history was attributable to the low grade chronic infection in the genitourinary tract probably prostatic in origin, or to the use of sulfonamide drugs or to influenza from respiratory inflammation or sinus infection. Two principal assignments were urged before the Supreme Court; that the court committed prejudicial error in the instructions on the issue of negligence and in rulings on the admission of evidence.

At the defendant's request the trial court charged the jury in substance that the defendant's negligence could not be presumed but must be based on the testimony of experts and that the jury could not set up a standard but must be governed solely by the testimony of expert witnesses. The plaintiff requested an instruction embodying the substance of the foregoing instructions and adding that expert testimony was not required to establish a fact based on common knowledge that danger is involved when certain precautionary measures, including sterilization, are not followed, whereupon whether the condition was caused by negligence may be decided in the light of such common knowledge. The requested instruction was refused, but at the plaintiff's request the jury was charged that, if it be found that the plaintiff sustained injury as the result of the introduction by the defendant of a new infection, an inference arose that the proximate cause of the injury was some negligence or malpractice on the part of the defendant, which it was incumbent on him to rebut by clear, positive and uncontradicted evidence that the injury occurred without any failure of duty on his part. The plaintiff contended that the instructions given were conflicting and confused the jury, that the correct theory of the case is that as a matter of common knowledge the result does not usually happen when sterilization has been proper and that expert testimony was not required to prove negligence. Therefore that the instructions in conflict with his theory were erroneous, misleading and prejudicial. On the other hand, the defendant questioned the propriety of any application of a doctrine based on common knowledge in the absence of the fact first established without conflict that the infection was introduced by the act of the defendant. It was therefore contended by the defendant that the record presented issues of fact solely within the knowledge of experts and that the plaintiff's given instruction, which incorporated a statement of the res ipsa loquitur doctrine, was more favorable to him than the record warranted.

The given instruction, said the Supreme Court, embodied a statement of the general rule, that the proper and usual practice in diagnosis and treatment is a question for experts and can be established only by their testimony as well as a statement of the exception known as the res ipsa loquitur doctrine. When the doctrine of res ipsa loquitur has been held applicable, evidence that the defendant did not cause the injury was remote and it followed as a matter of common knowledge from the nature of the injury that the result would not have happened without carlessness or negligence. In the present case, said the Supreme Court, the inference that the injury was caused by some source other than the defendant was not remote but could be drawn from substantial evidence in the record. Before compelling inference based on common knowledge, which is at the root of the res ipsa loquitur doctrine, would be justified it became necessary for the plaintiff to eliminate himself as a proximate cause of the injury. The evidence on that issue was conflicting and the trial court correctly submitted the case to the jury with statements of both the general rule and the exception. It may not be said that the jury was misled to the prejudice of the plaintiff on a record of conflicting evidence containing substantial support of the jury's verdict, and this court, the Supreme Court concluded, is therefore not at liberty to disturb the result of the jury's deliberations.

It was also urged that the trial court unduly limited the plaintiff's examintaion of his expert witness. It appeared from the testimony of this witness that he had practiced as an autopsy surgeon for 29 years, that he did not practice urology, did not conduct genitourinary examinations in the diagnostic or treatment fields and did not know the method of practice therein but that he had learning and knowledge of the anatomy of and infections in relation to the genitourinary system. When this testimony was given and after consultation and offers of proof in chambers, the trial court excluded hypothetical questions addressed to this witness based on his knowledge of existing standards in the practice of urology but permitted one hypothetical question to elicit the witness' opinion as to the cause of the infection. A medical expert, said the Supreme Court, is not qualified as a witness unless he is shown to have the required professional knowledge, learning and skill to express his opinion, and is familiar with the standards required of physicians in similar circumstances. In view of the witness's admitted lack of practice in urology, the extent of the examination as to his qualifications in relation to the subject matter of his opinion was within the sound discretion of the trial court. No prejudicial error or abuse of discretion is shown.

Accordingly the judgment of the trial court in favor of the defendant physician was affirmed.—*Moore v. Belt, 212 P. (2d) 509 (Calif., 1949).*

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of five days. Three journals may be borrowed at a time. Periodicals are available from 1939 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

39:160 (Jan.) 1950

Cardiac Disease in Pregnancy: Study of Patients with Heart Disease at Philadelphia Lying-In Division of Pennsylvania Hospital from 1937 to 1947, Inclusive. J. B. Vander Veer and P. T. Kuo.—p. 2.
Approach to Spatial Electrocardiogram. R. P. Grant.—p. 17.
*Cholesterol Content of Coronary Arteries and Blood in Acute Coronary Artery Thrombosis. L. M. Morrison and K. D. Johnson.—p. 31.
Factors Influencing T Wave of Electrocardiogram. Experimental Study Employing Intracavitary and Extraventricular (Epicardial) Leads: I. Effects of Heating and Cooling Endocardium and Epicardium. H. K. Hellerstein and I. M. Liebow.—p. 35.
Plasma Prothrombin Times in Normal Human Subjects. Effect of Certain Factors on Prothrombin Time. R. S. Overman, A. A. Newman and I. S. Wright.—p. 56.
Effect of Aminophylline on Prothrombin Time of Normal Human Plasma. R. S. Overman and I. S. Wright.—p. 65.
Effect of Ergotamine Tartrate on Abnormal Electrocardiogram in Patients Previously Prepared with Tetraethylammonium Chloride. M. Schlachman and D. Scherf.—p. 69.
*Hemorrhage into Arterial Wall as Cause of Peripheral Vascular Disease. W. B. Wartman.—p. 79.
Further Observations on Vagal Influences on Heart During Electroshock Therapy for Mental Disease. M. D. Altschule.—p. 88.
Quantitative Blood Flow Measured Calorimetrically in Human Toe in Normal Subjects and Patients with Residua of Trench Foot and Frostbite. M. Mendlowitz and H. A. Abel.—p. 92.
Five-Minute Arterial Occlusion Technique for Determination of Vascular Insufficiency. B. Kondo, T. Winsor, P. Yamauchi and others.—p. 99.
Method for Percutaneous Introduction of Venous Catheters. P. Formijne.—p. 111.
Visualization of Coronary Circulation During Angiocardiography. A. J. Gordon, S. A. Brahms and M. L. Sussman.—p. 114.
Electrocardiogram Following Anastomosis of Carotid Artery to Coronary Sinus. E. Leiter.—p. 125.

Cholesterol and Thrombosis of Coronary Artery.—Morrison and Johnson studied the cholesterol content of the anterior descending branch of the left coronary artery in 11 patients who had died of acute coronary artery thrombosis and in a comparable group of 14 patients who died of causes other than coronary artery thrombosis. They also studied the blood serum cholesterol and ester levels in both of these groups and the gross appearance of the aorta and coronary arteries for evidence of atherosclerosis in these patients. The average cholesterol content of the coronary arteries in a group of patients who died from an acute coronary artery thrombosis was found to be four times as great as the average cholesterol content of the coronary arteries in a comparable group of control patients. Hypercholesteremia was found in most of the patients who died of acute coronary artery thrombosis, as compared to a normal blood cholesterol average in the comparable control group. These observations suggest that a disturbance in lipid metabolism is a factor in the pathogenesis of atherosclerosis.

Hemorrhage Into Arterial Wall.—According to Wartman, bleeding frequently takes place into the intima of a sclerotic artery. These hemorrhages were generally regarded as the result of breaks in the intima which permitted infiltration of blood from the main current into the coats of the diseased artery. It is now established that in most cases these hemorrhages result from ruptures of the capillaries ramifying within the diseased intima or media and arising from either the lumen of the sclerotic artery or the vasa vasorum. In health the vasa vasorum penetrate to the media of large arteries but do not enter the intima. In disease and especially in arteriosclerosis, vasa vasorum are present in the thickened intima. Not only does intramural hemorrhage occur in the coronary arteries, but it has been observed in most of the large arteries of the body. Intramural hematomas occur in the arteries of the lower extremities and may cause occlusion either by pressure alone or by rupture and subsequent thrombus formation. The author reports 3 cases in which hemorrhage into the intima or media was a precipitating factor in the obstruction, as determined at autopsy. The affected parts of the arteries were removed, washed free of blood, fixed, embedded, sectioned and stained. The changes in the iliac and femoral arteries of these adults were identical with those which are known to occur in the coronary, pulmonary, cerebral and renal arteries and in the aorta. The discovery of many thin-walled capillaries in the sclerotic arteries in these 3 cases lends additional support to the idea that the hemorrhages result from the rupture of these capillaries, which then bleed into the wall of the vessel. It is interesting that in these patients the arterial disease in the vessels of the lower extremities was only a part of a generalized arteriosclerosis which also caused serious manifestations in other organs. All had hypertension with vascular disease of the kidneys; 2 showed advanced sclerosis of the aorta with thrombosis, and 1 had both recent and remote occlusions of the coronary arteries with multiple myocardial infarcts. This indicates that in some patients vascular disease of the lower extremities may be one manifestation of a generalized disease process.

American J. Digestive Diseases, Fort Wayne, Ind.

17: 1-30 (Jan.) 1950

Treatment of Ulcerative Colitis with Fractional Component of Hog Stomach Extract. R. Ehrlich.—p. 1.
Etiology and Pathogenesis of Prolapsed Gastric Mucosa into Duodenum. A. Melamed.—p. 4.
Physics in Intestinal Intubation. M. O. Cantor.—p. 10.
Angina Pectoris Simulated by Chronic Peripancreatitis and Pancreatitis. M. W. Mettenleiter and F. J. Lust.—p. 11.
Massive Resection of Small Bowel for Adenocarcinoma of Jejunum. R. J. Kositchek and M. H. Rabwin.—p. 13.
Adsorption of Bacterial Toxins by Inert Particulate Materials. J. Moss and G. J. Martin.—p. 18.
Problems in Intravenous Administration of Synthetic and Natural Fats for Nutritional Purposes. H. H. LeVeen, G. Papps and M. Restuccia.—p. 20.

American Journal of Hygiene, Baltimore

51:1-134 (Jan.) 1950. **Partial Index**

Status and Significance of Inapparent Infection with Virus of Japanese B Encephalitis in Japan in 1946. M. B. Bawell, R. E. Jeuel Jr., M. Matumoto and A. B. Sabin.—p. 1.
Search for Virus of Japanese B Encephalitis in Various Arthropods Collected in Japan in 1946-1947. A. B. Sabin.—p. 36.
Study of Canine Encephalitis. H. Koprowski, G. A. Jervis, T. R. James and others.—p. 63.
Immunologic Groups of Poliomyelitis Viruses. J. F. Kessel and C. F. Pait.—p. 76.
Subclinical Poliomyelitis in Chimpanzee and Its Relation to Alimentary Reinfection. H. A. Howe, D. Bodian and I. M. Morgan.—p. 85.
*Epidemiologic Characteristics of Poliomyelitis in Iceland. J. Sigurjonsson.—p. 109.
Virus and Host Factors Influencing Titer of Lansing Poliomyelitis Virus in Monkeys, Cotton Rats and Mice. D. Bodian, I. M. Morgan and C. E. Schwerdt.—p. 126.

Poliomyelitis in Iceland.—Analysis of the epidemiologic features of poliomyelitis in Iceland, as manifested since the disease was first recognized in 1904, provides, according to Sigurjonsson, an illustration of the behavior of this disease as influenced by the conditions of living, climate, ecology and environment peculiar to this far northern country. The causative virus has been able to maintain itself over considerable periods of time in this relatively isolated island population of 80,000 to 130,000, one third of which is concentrated in a single urban area and the rest scattered over a huge territory in small communities and on farms with limited intercommunication. Moreover, the virus has become prevalent in this population during a period when transport, communication, living conditions, home hygiene and community sanitation were being steadily improved. Poliomyelitis has appeared in epidemics at intervals of about ten years. As measured by morbidity and mortality rates, these epidemics have been severe in comparison with those in countries of Northern Europe and North America. During the interepidemic periods the disease has either completely disappeared or existed at a low and probably largely subclinical level. Cases

of poliomyelitis have occurred in every month of the year but usually reach maximum numbers in the autumn. The most recent epidemic reached its peak in the winter. The age distribution has shown an interesting shift. In the earlier epidemics the highest attack rate was in children under 5 years of age. In recent years there has been a distinct shift in the distribution of cases toward older ages. In the latest epidemic the highest attack rate was reached in the 15 to 19 year age group, and a considerable proportion of cases was in adults. This shift in age distribution is more pronounced than that observed in some parts of Europe and North America. The author suggests as an alternative hypothesis the possibility that the shift in age distribution is due in part to coincident prevalence of an unidentified disease which closely resembles poliomyelitis. This might account also for the unusual (midwinter) seasonal distribution and for the extremely high morbidity rates.

American J. Obstetrics and Gynecology, St. Louis

59:1-236 (Jan.) 1950. **Partial Index**

Anatomy and Histology of Sacrouterine Ligaments. R. M. Campbell. —p. 1.
Premature Separation of Normally Implanted Placenta: Clinicopathological Study of 276 Cases. L. I. Sexton, A. T. Hertig, D. E. Reid and others.—p. 13.
Electrical Activity of Human Uterus in Labor: Electrohysterograph. C. M. Steer and G. J. Hertsch.—p. 25.
Intravenous Pituitary Extract in Labor with Data on Patterns of Uterine Contractility. L. M. Hellman, J. S. Harris and S. R. M. Reynolds.—p. 41.
Intravenous Use of Dilute Pituitrin for Induction and Stimulation of Labor: Preliminary Report. M. L. Stone.—p. 49.
Primary Carcinoma of Fallopian Tube. C. Y. Hu, M. L. Taymor and A. T. Hertig.—p. 58.
Habitual Abortion: Incompetent Internal Os of Cervix. A. F. Lach and S. R. Lash.—p. 68.
Recent Trends in Cesarean Section. R. G. Douglas and R. Landesman. —p. 96.
Rupture of Pregnant Uterus. J. F. Brierton.—p. 113.
Method of Isometric Pelvimetry with Accurate Outlet Measurements. E. Treptow and A. M. Lilienfeld.—p. 125.
*Evaluation of Radical Hysterectomy in Treatment of Carcinoma of Cervix. J. F. Donnelly and J. B. Caldwell.—p. 133.
Retained Placenta: Delivery by Hydraulic Method (Mojon-Gabastou Injection). C. D. Bradley.—p. 141.
Experiences with Rh Hapten. J. W. Goldsmith.—p. 172.
Mortality Following Exchange Transfusion in Erythroblastosis Fetalis: Preliminary Report. A. S. Wiener and I. B. Wexler.—p. 178.
Analysis of Breech Deliveries in General Hospital. W. E. Gibson. —p. 180.
Prophylactic Use of Penicillin and Streptomycin in Certain Obstetric Conditions. H. C. Hesseltine and S. B. Kephart.—p. 184.
Role of Infection in Premature Rupture of Membranes. I. C. Knox Jr. and J. K. Hoerner.—p. 190.
Treatment of Granuloma Inguinale with Streptomycin. C. R. Freed and F. M. Kern.—p. 195.

Radical Hysterectomy in Carcinoma of the Cervix.—After the advent of irradiation therapy for carcinoma of the cervix, the therapeutic pendulum swung to nonoperative treatment and remained there until recent years, because (1) many patients were inoperable; (2) the primary operative mortality was high, and (3) irradiation therapy had a lower primary mortality rate, universal application and a satisfactory recovery rate. The Wertheim operation or radical hysterectomy was long regarded as obsolete, but during the past ten years there has been an increasing interest in surgical treatment. Twenty-five patients, about a fourth of those admitted to the Department of Obstetrics and Gynecology of the Bowman Gray Medical School between the years 1944 and 1948, were subjected to the Wertheim operation. Nearly all the patients received preoperative irradiation consisting of 8,120 r of high voltage roentgen therapy and 4,000 to 6,000 mg. hours of radium. With the exception of a few patients with preinvasive and very early invasive carcinoma, a complete radical hysterectomy was done. There was a large number of postoperative complications, 16 of which were due to urinary tract infection. The majority of the latter were relatively harmless; several were severe and suggested primary injury of the urinary tract. In addition, there were 3 cases of pelvic cellulitis, 1 of peritonitis, 1 of evisceration, 1 pelvic abscess, 1 pulmonary embolism, 1 ureteral obstruction, 1 hydronephrosis, 2 rectovaginal fistulas, 1 vesicovaginal fistula and 1 death. Some of these complications were overlapping. Twenty-two patients were followed; in no case was active cancer noted. The longest follow-up period was three years. Whether the Wertheim operation will improve the present recovery rate remains to be proved.

American Journal of Ophthalmology, Chicago

33:1-174 (Jan.) 1950

Diseases of Orbit: Jackson Memorial Lecture. W. L. Benedict.—p. 1.
Dependence of Surgery on Physiology: with Special Reference to Treatment of Glaucoma. S. Duke-Elder.—p. 11.
Gummas of Eyelid. J. V. Cassady.—p. 18.
Retinal Dysplasia. A. B. Reese and F. C. Blodi.—p. 23.
Some Effects of Injection of Hyaluronidase into Anterior Chamber. J. G. Linn Jr. and T. L. Ozment.—p. 33.
Method of Determining Concentration of Dithiocarbamates in Aqueous Humor. E. B. Dunphy and F. Call.—p. 44.
Experimental Studies of Fatigue of Accommodation. H. C. Berens and S. B. Sells.—p. 47.
Effects of Metabolic Poisons and Some Other Agents on Intercellular Cohesion in Corneal Epithelium. W. Buschke.—p. 59.
Choroiditis Proliferans: Charles H. May Lecture. A. Fuchs.—p. 69.
Craniofacial Dysostosis (Crouzon's Disease). M. M. Parks and F. D. Costenbader.—p. 77.
Bilateral Paralysis of External Rectus Muscle in Hypertelorism: Report of Case with Convergent Strabismus. A. E. Meisenbach Jr.—p. 83.
Diplopia of Provocation: Its Neurologic Significance. J. Sédan and S. Sédan-Bauby.—p. 87.
Research in Use of Curare for Ocular Surgery. J. R. Roche.—p. 91.
Use of Intravenous Morphine in Ocular Surgery. C. D. F. Jensen, G. N. Haffly and L. J. Sarro.—p. 98.
Vascular Nevus Associated with Heterochromia. E. Rosen.—p. 107.
Aspergillosis of Cornea. S. G. Stern and M. M. Kulvin.—p. 111.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

63:1-148 (Jan.) 1950

Therapeutic Radiology as a Specialty. U. V. Portmann.—p. 1.
Planning Radioisotope Program in Hospital. E. H. Quimby and C. B. Braestrup.—p. 6.
Cancer of Lip. B. P. Widmann.—p. 13.
Bronchopulmonary Segments. H. L. Temple and J. A. Evans.—p. 26.
Pathological Condition in Inferior Accessory Lobe and Its Pleura. J. W. Grossman and C. F. Fishback.—p. 47.
*Roentgenographic Detection of Coronary Arteriosclerosis. J. E. Habbe and H. H. Wright.—p. 50.
Report of Case of Rupture of Thoracic Aorta. C. Gottlieb and W. K. Peck.—p. 63.
Roentgen Studies of Upper Gastrointestinal Tract in Vagotomy. F. Isaac, R. E. Ottoman and J. A. Weinberg.—p. 66.
Benign Non-Obstructing Tumors of Small Intestine: Report of 2 Cases. E. C. Osgood.—p. 76.
Recurrent Small Intestinal Intussusception in Children. M. D. Teitelbaum and N. Arenson.—p. 80.
Nature of Fictitious Polyps in Colon. C. A. Stevenson, R. D. Moreton and E. M. Cooper.—p. 89.
Carcinoma of Testicle with Metastasis to Bone: Report of 2 Cases, 1 in Pseudohermaphrodite. J. O. Lafferty and E. P. Pendergrass. —p. 95.
*Bone Involvement in Cryptococcosis (Torulosis). V. P. Collins.—p. 102.
Simple Method of Identifying Multiple Foreign Bodies About or In Eye for Localization. E. L. Shiflett.—p. 113.

Roentgenographic Detection of Coronary Arteriosclerosis.—Habbe and Wright evolved a technic of routinely searching for coronary arteriosclerosis in all patients over 40 years of age who were referred for cardiac roentgen study. The method has permitted detection of coronary arteriosclerosis with a frequency somewhat greater than that of sclerosis of the heart valves. In two and one-half years, during which every patient over the age of 40 with cardiac disease received the benefit of multiple spot-aimed roentgenograms and kymograms, an incidence of approximately 3 per cent of coronary arteriosclerosis was demonstrated, and approximately 1.5 per cent had sclerotic valves or annuli. With the described roentgenographic technic the authors found nearly twice as many cases of coronary arteriosclerosis as might be found by routine searching with roentgenoscopy only. These pathologic processes of lesser degree, found mostly in the 50 to 60 year age group, are probably more important clinically than the advanced degrees of sclerosis seen in the 70 to 80 year age group.

Bone Involvement in Cryptococcosis (Torulosis).—According to Collins cryptococcosis is widely known as torulosis. The causative organism, Cryptococcus neoformans, is also termed Cryptococcus hominis or Torula histolytica. The organism belongs to the group of fungi imperfecti. It appears as encapsulated, rounded budding cells, usually 5 to 8 microns in diameter, producing no myceliums or spores. The organisms

have frequently been mistaken for lymphocytes or red blood cells. Lesions due to C. neoformans produce a gelatinous or mucoid exudate, which has often given the impression of a myxomatous tumor. The author believes that a closer investigation of atypical cases of Hodgkin's disease will also disclose further instances of cryptococcosis. The disease is best known when it takes the form of meningoencephalitis, but the author discovered 17 cases of bone involvement in over 200 cases reported in the literature. Three additional cases with bone involvement are reported in which roentgen observations were made over periods up to fifteen months. The osseous lesions were widely disseminated and discrete. The lesions were chronic, but regression is apparently possible with the reformation of bone of normal structure. The slow rate of change in these disseminated areas of bone destruction seems to be significant in the recognition of the disease. The bone lesions in the 3 described cases of cryptococcosis fall within the range of variation described as common to blastomycosis and coccidioidomycosis. These three mycoses differ from actinomycosis in both the distribution and character of the osseous lesions. In the former the lesions are disseminated and discrete, whereas in actinomycosis the infection tends to extend by direct continuity, riddling the regional bone.

Am. Practitioner & Digest of Treatment, Philadelphia

1:1-112 (Jan.) 1950

Recognition and Diagnosis of Diabetes Mellitus. B. F. Keltz.—p. 1.
Recent Advances in Parenteral Therapy in Pediatrics. P. Cohen and E. Dubow.—p. 3.
Basic Principles in Diagnosis and Treatment of Fractures. A. F. Voshell.—p. 8.
Rupture of Heart Muscle in Association with Coronary Arterial Disease. J. M. Askey and A. F. Edwardes.—p. 14.
*Bed Pan Deaths. J. McGuire, R. S. Green, V. Hauenstein and others. —p. 23.
Von Recklinghausen's Disease; Its Relationship to Other Types of Neuro-Ectodermal Dysplasia. G. E. Hein and J. C. Reavis.—p. 29.
Physiologic Considerations in Thyroid Disturbances and Therapy. W. V. Whitehorn.—p. 36.
Seminiferous Tubule Failure Associated with Degenerative Change in Hypothalamus: Clinicopathologic Report of Case of Reactive Gliosis of Floor of Third Ventricle. E. Anderson, W. Haymaker and H. Rappaport.—p. 40.
Diagnosis and Treatment of Functional Indigestion. T. L. Althausen. —p. 46.
Priscoline as Adjunct for Relief of Vasospasm in Peripheral Vascular Disease. J. B. Lagen.—p. 50.
Use of Aureomycin Ointment in Dermatology. L. Hollander and S. M. Hardy.—p. 54.
New Method for Intermittent Injection of Antibiotics. B. M. Wagner and A. E. Pearce.—p. 58.
Clinical Investigation of Digitoxins. G. Schwartz.—p. 61.
Current Views Concerning Nature and Management of Leukemia and Allied Disorders. M. M. Wintrobe.—p. 68.

Bed Pan Deaths.—McGuire and his associates investigated the autopsy protocols and clinical records of patients in the Cincinnati General Hospital who died on bed pans during the period 1936 to 1946, inclusive. A review of 6,700 autopsy protocols revealed that 11 patients died suddenly while using the bed pan. The true incidence of bed pan deaths in the Cincinnati General Hospital was unquestionably far higher than this figure indicated since only cases coming to autopsy were included. The authors investigated the influence on the circulation of deliberately increased intra-abdominal and intrathoracic pressures in normal subjects and in patients with heart disease by requesting the subject concerned to take a deep breath, hold it and strain as if he were endeavoring to have a bowel movement. Electrocardiograms before, during and after strain have been recorded and measurements made of intravascular pressures with strain gages. Intrapleural pressures were measured in patients with pneumothorax by water manometers. Sharp rises in intra-arterial and intravenous blood pressures occurred during strain on bed pans, with pronounced changes in rate and rhythm of the heart. The majority of persons dying on bed pans had serious organic heart disease. It seems probable that cardiac arrhythmias, vascular hemorrhage and pulmonary embolism are the mechanisms responsible for death of subjects while straining at stool. The use of atropine, the avoidance of constipation to eliminate the necessity of severe straining at the stool and early ambulation of surgical patients to reduce the incidence of venous thrombosis may be means of reducing such deaths.

Annals of Allergy, Minneapolis

7:727-862 (Nov.-Dec.) 1949. **Partial Index**

Chronic Ulcerative Colitis—Allergic Disease. A. H. Rowe.—p. 727.
Testing for Identity and Purity of Pollen Extracts. R. P. Wodehouse. —p. 752.
Persistent Cough and Bronchospasm Due to Exposure to Fumes from Range Oil: New Clinical Syndrome. E. A. Brown.—p. 756.
Aerosols: I. Urinary Exretion of Inhaled Phenolsulfonphthalein Mists. H. A. Abramson, C. Reiter, H. H. Gettner and B. Sklarofsky.—p. 761.
Comparative Toxicity and Side Effects of Antihistaminic Drugs. E. Schwartz.—p. 770.
Evaluation of Neo-Antergan in Dermatology. N. Tobias and J. Grindon Jr.—p. 778.
Subcutaneous Emphysema Complicating Chronic Bronchial Asthma: Report of 2 Cases. S. W. Chester.—p. 783.
Unusually Good Results in Pollinosis with Combined Antigen-Antihistamine Therapy, Shortening Treatment of Hay Fever: Study I. A. L. Maietta.—p. 789.
Significance of Mediastinal Shift in Asthma. L. H. Osmond.—p. 799.
Skin Sensitization to BAL Ointment. C. M. Jenkins.—p. 807.

Annals of Internal Medicine, Lancaster, Pa.

32:1-206 (Jan.) 1950

Use of Isotopes as Metabolic Tracers. D. Stetten Jr.—p. 1.
Cryoglobulinemia: I. Report of 2 Cases with Discussion of Clinical Manifestations, Incidence and Significance. D. P. Barr, G. G. Reader and C. H. Wheeler.—p. 6.
Duration of Infection in Scarlet Fever. P. S. Rhoads, G. P. Youmans and R. Rosi.—p. 30.
Electrokymography—Appraisal of Its Present Clinical Status. J. L. Lewis Jr. and L. L. Terry.—p. 36.
Pituitary Myxedema: Report of 3 Cases. H. St. G. Tucker Jr., J. L. Chitwood and C. P. Parker Jr.—p. 52.
Serum Proteins in Rheumatoid Arthritis. A. D. Wallis.—p. 63.
Studies in Disorders of Muscle: I. Problem of Progressive Muscular Dystrophy. F. H. Tyler and M. M. Wintrobe.—p. 72.
*Response of Acute Leukemia to Administration of Folic Acid Antagonists, Aminopterin and A-Methopterin: Report of 14 Cases. M. S. Sacks, G. T. Bradford and E. B. Schoenbach.—p. 80.
Treatment of Paroxysmal Supraventricular Tachycardia with Lanatoside C. J. G. Barrow.—p. 116.
Visualization of Skin Veins with Use of Dark-Adaptor Glasses. S. J. Schneierson and P. Krainin.—p. 120.

Response of Acute Leukemia to Folic Acid Antagonists.—Sacks and co-workers report on 14 patients with leukemia, 6 females and 8 males, 5 children between the ages of 11 months and 8 years, 3 adolescents between the ages of 15 and 17 and 6 adults between the ages of 26 and 63. Four patients had acute myeloid leukemia, 7 had leukemia of the acute lymphoid variety and 3 had acute monocytic leukemia. The therapeutic regimen employed from April 1948 to June 1949 consisted in the liberal use of whole blood transfusions, various antibiotics and the folic acid antagonists, aminopterin (4-aminopteroylglutamic acid) and a-methopterin (4-amino, 10-N-methylpteroylglutamic acid). Aminopterin was given in doses of 0.5 to 2 mg. per day intramuscularly and a-methopterin in doses of 2 to 4 mg. daily. Two patients with acute myeloid leukemia, a woman aged 39 and a child aged 14 months, responded to the treatment with a complete, temporary, clinical and hematologic remission. The duration of the remission in the adult patient was eighty-one days, after which relapse and death occurred; the child had a complete remission lasting about thirty days. Partial temporary remissions were observed in 3 patients, all of whom subsequently died. The course of the disease in the remaining 9 patients was considered to have been uninfluenced by the therapy. Maintenance therapy is considered advisable in patients with partial or complete temporary remissions. Some of the patients were able to take relatively large doses before the occurrence of toxic effects, but others showed early signs of toxicity, such as ulcerative stomatitis, diarrhea, bone marrow aplasia and alopecia. Terminal icterus was noted in several patients, but because of the use of massive whole blood transfusions the possibility of a virus etiologic basis rather than drug toxicity could not be entirely disregarded. The narrow margin between therapeutic efficacy and toxicity renders widespread and uncontrolled use of the folic acid antagonists somewhat hazardous, but the occurrence of undisputed remissions to an extent hitherto unheard of in acute leukemia offers sufficient incentive for continued therapeutic trials.

Archives of Dermatology and Syphilology, Chicago

61:175-360 (Feb.) 1950

Appraisal of Objectives and Functions of American Dermatological Association: Presidential Address. H. R. Foerster.—p. 177.
*Treatment of Syphilis with Aureomycin Administered by Mouth. R. R. Kierland, W. E. Herrell and P. A. O'Leary.—p. 185.
Treatment of Early Syphilis with Penicillin and Bismuth Subsalicylate: Daily Injection of 500,000 Units of Penicillin G in Sodium Chloride Solution for Twenty Consecutive Days and Ten to Twenty Doses of Bismuth Subsalicylate at Rate of Two a Week. V. Pardo-Castello and O. A. Pardo.—p. 196.
Viruses of Special Interest to Dermatologist: Review. M. R. Hilleman.—p. 210.
Hormonal Therapy of Acne Vulgaris in Female: Clinical Attempt at Its Evaluation. W. H. Goeckerman.—p. 237.
Persistent, Aberrant Mongolian Spots. H. N. Cole Jr., W. R. Hubler and H. Z. Lund.—p. 244.
Protein Deficiency in Cutaneous Disease. W. B. Guy.—p. 261.
Tryparsamide and Bismuth Subsalicylate in Treatment of Experimental Syphilis by Rabbits: Synergistic or Additive Activity. J. A. Kolmer.—p. 271.
Cutaneous Metastases Secondary to Carcinoma of Urinary Bladder: Report of 2 Cases and Review of Literature. J. H. McDonald, N. J. Heckel and H. L. Kretschmer.—p. 276.
Reevaluation of Weltmann Serum Coagulation Reaction in Syphilis and Various Dermatoses. L. Goldstein.—p. 285.
Monilial Granuloma: Report of Case and Review of Literature. F. V. Hauser and S. Rothman.—p. 297.
Nevus Syringadenomatosus Papilliferus: Report of Case. B. Appel.—p. 311.
Acrodermatitis Pustulosa Perstans: Report of Case in Child. W. Sachs and H. Field.—p. 319.

Aureomycin, Oral Therapy in Syphilis.—Kierland and his associates at the Mayo Clinic administered aureomycin orally to patients with early infectious syphilis and to patients with late cutaneous syphilis and neurosyphilis. Two patients with dark-field-positive primary lesions of syphilis were given aureomycin orally. The lesions became dark field negative rapidly and healed, and the serologic reactions became negative. There was no clinical or serologic evidence of relapse to the time of the present report. Two patients with long-standing, previously unrecognized, late noduloulcerative, cutaneous syphilis were given aureomycin orally. The cutaneous lesions quickly disappeared, and healing progressed rapidly. The serologic patterns showed no change during the short period of observation. Two patients with neurosyphilis showed improvement. When aureomycin was given in doses of 250 mg. every four hours or 500 mg. every six hours, levels between 2 and 4 micrograms per cubic centimeter of blood serum were obtained; when the drug was given in doses of 750 mg. every four hours, or 1 Gm. every six hours, levels of 4 to 8 micrograms per cubic centimeter of serum were frequently observed. Therapeutically effective concentrations of aureomycin in the blood serum may be expected when the antibiotic is given but two or three times daily. Aureomycin is widely distributed through the tissues, readily traverses the blood-brain barrier and is present in the cerebrospinal fluid after oral administration of amounts commonly used for most infections. The total dose of aureomycin given in the 7 cases varied from 44.2 to 90.5 Gm. The authors conclude that aureomycin exhibits definite antisyphilitic activity. Aureomycin should be of value in the treatment of a patient with syphilis who has become resistant or who is sensitive to penicillin.

Archives of Pathology, Chicago

49:111-246 (Feb.) 1950

Brain Metabolism in Vivo: I. Distribution of Lesions Caused by Cyanide Poisoning, Insulin Hypoglycemia, Asphyxia in Nitrogen and Fluoroacetate Poisoning in Rats. S. P. Hicks.—p. 111.
Experimental Argyrosis: V. Hypertrophy of Left Ventricle of Heart in Rats Ingesting Silver Salts. C. T. Olcott.—p. 138.
Hypertrophic Ileac Stenosis Simulating Regional Enteritis: Report of Case with Necropsy. P. M. Zeek and L. G. Herrmann.—p. 150.
Cyst of Spleen in Sickle Cell Anemia. H. R. Pratt-Thomas and P. K. Switzer.—p. 159.
Localized Lymph Node Sarcoidosis Associated with Carcinoma of Bile Ducts: Report of Case. G. J. Gherardi.—p. 163.
Effect of Cholesterol Feeding in Hamsters. J. Goldman.—p. 169.
Tryptophan Deficiency in Rat: Histologic Changes Induced by Forced Feeding of Acid-Hydrolyzed Casein Diet. F. B. Adamstone and H. Spector.—p. 173.
Potassium Deficiency Syndrome in Rat and Dog: Description of Muscle Changes in Potassium-Depleted Dog. S. G. Smith, B. Black-Schaffer and T. E. Lasater.—p. 185.
Effect of Subcutaneous and Intraoral Administration of Carbon Tetrachloride on Liver of Rat. J. F. McCloskey and E. H. McGehee.—p. 200.

Arizona Medicine, Phoenix

7:1-88 (Jan.) 1950

Brucellosis (Synonyms: Undulant Fever, Malta Fever, Mediterranean Fever, Texas Fever, Rio Grande Fever, Neapolitan Fever, Brucelliasis.) A. G. Bower.—p. 23.
Brucella Infection of Bones and Joints. C. N. Ploussard.—p. 31.
Early Diagnosis and Treatment of Pertussis. B. O. Barnes and P. Mason.—p. 34.
Palliative Therapy of Benign Hypertension with Calcium Bromine Galactogluconate-Preliminary Clinical Note. A. L. Lieberman.—p. 36.
Effectiveness of Treatment of Allergic Dermatoses. R. A. Wilson.—p. 37.

Blood, New York

5:1-106 (Jan.) 1950

Studies on Blood Formation and Destruction in Polycythemia of High Altitude. C. F. Merino.—p. 1.
Hemorrhagic Syndrome of Acute Ionizing Radiation Illness Produced in Goats and Swine by Exposure to Atomic Bomb at Bikini, 1946. E. P. Cronkite.—p. 32.
Hemophilia-Like Disease with Prolonged Coagulation Time and Circulating Anticoagulant: Report of Case in Female. O. H. Dreskin and N. Rosenthal.—p. 46.
*Dangerous Universal Donors: I. Observations on Destruction of Recipient's A Cells After Transfusion of Group O Blood Containing High Titer of A Antibodies of Immune Type not Easily Neutralizable by Soluble A Substance. D. M. Ervin and L. E. Young.—p. 61.
*Phase Microscopy Studies of Hodgkin's Disease Lymph Nodes in Relation to Histogenesis of Sternberg-Reed Cell. G. T. Hoffmann and A. Rottino.—p. 74.
Localization of Lipids in Human Blood and Bone Marrow Cells. M. L. Bloom and G. B. Wislocki.—p. 79.
Observations on Hematologic Values of Japanese. F. M. Snell.—p. 89.

Dangerous Universal Donors.—Erwin and Young report a severe hemolytic reaction occurring in a group A (A intermediate subgroup) recipient after transfusion of group O blood from a donor whose serum contained A antibodies in high titer. Hemoglobinemia persisted for at least thirty hours, during which period the patient became severely anemic. Azotemia, hyperbilirubinemia, spherocytosis and increased osmotic and mechanical fragilities of the patient's erythrocytes were observed for nine days. The recipient was rendered temporarily incompatible with prospective A_1 donors as a result of incomplete absorption of the anti-A agglutinins in the transfused group O blood. The A antibodies in the serum of the dangerous universal donor were shown to have the following peculiarities: (*a*) When normal AB serum was used as a diluent for the group O serum and as a medium for cell suspensions, the titer against A_1 cells was higher than that obtained with isotonic sodium chloride solution as a diluent and suspension medium. (*b*) After "neutralization" with soluble A and B factors, the group O serum agglutinated neither A nor B cells in "saline systems," but in "serum systems" the treated O serum still agglutinated A_1 cells in very high titer and A-intermediate cells in low titer. (*c*) A_1 cells, but not A intermediate or A_2 cells, gave positive reactions with anti-human-globulin rabbit serum (indirect Coombs test) after exposure to the neutralized O serum. (*d*) The group O serum hemolyzed and fixed complement with all types of A cells but not B cells. These peculiarities suggested that the group O donor had developed A antibodies of immune type and predominantly of A_1 specificity, but the stimulus for production of these antibodies could not be ascertained. It is emphasized that the type of antibody, natural or immune, as well as the titer, must be taken into account in any attempt to assess the changes inherent in the use of universal donors and that "conditioning" of group O blood by addition of soluble A and B factors in conventional quantities may not effectively neutralize immune A_1 and B antibodies if such be present. Further observations are needed to show whether or not neutralization of "saline" agglutinins and hemolysins by A and B factors may render dangerous bloods relatively safe despite the persistence of incomplete antibodies.

Hodgkin's Disease; Lymph Nodes.—Hoffmann and Rottino studied lymph nodes from 20 patients with Hodgkin's disease with the Spencer phase microscope. Observations indicated that the free reticulum cell in this disease undergoes progressive cytologic alteration leading to the formation of Sternberg-Reed cells. The other free cellular components of the lymph nodes were observed to be cytologically normal. From the point of view of pathologic cytology the authors

feel that Hodgkin's disease is essentially a reticulum cell aberration, with the variation in lymphocyte pattern representing a reaction phenomenon.

Canadian Medical Association Journal, Montreal

62:1-108 (Jan.) 1950

National Health Service in England. W. Magner.—p. 1.
*Preliminary Report on Adrenocorticotrophic Hormone (ACTH) in Asthma. B. Rose, J. A. P. Parc, K. Pump and R. L. Stanford. —p. 6.
Training of General Practitioner. W. M. Johnson.—p. 9.
Carcinoma of Breast. R. M. Janes.—p. 14.
Thiocyanate Therapy. W. F. Connell, G. K. Wharton and C. E. Robinson.—p. 20.
*Cancer of Lip. C. C. Burkell.—p. 28.
Arthritis—Plan for Attack. Prepared by the Canadian Arthritis and Rheumatism Society.—p. 34.
Children's Health Centres and Their Uses. D. Paterson.—p. 39.
Modern Treatment of Neurosyphilis. G. B. Sexton.—p. 43.
Treatment of Acne Vulgaris. J. F. Burgess.—p. 48.
Ectopic Pregnancy. E. H. McFadyen.—p. 51.
Laryngeal vs. Gastric Cultures in Detection of Tubercle Bacilli. M. Duggan and L. Delamater.—p. 54.
Clinical Value of Streptomycin Resistance Tests in Tuberculosis. W. Anderson and J. D. Smith.—p. 56.
In Vivo Development of Streptomycin Resistance by Tubercle Bacillus. W. Anderson and M. Kaake.—p. 59.
Extra-Peritoneal, End-to-End Suture of Femoral Nerve. C. Gardner and H. Elliott.—p. 61.
Glomus Tumors. H. Gold.—p. 64.
Male Frog, Rana Pipiens, as Biological Test Animal for Diagnosis of Pregnancy. D. M. Bell, J. W. Macgregor and J. R. Vant.—p. 68.
*Homologous Serum Jaundice Transmitted by Tattooing Needle. R. H. Roberts and H. Still.—p. 75.

Pituitary Adrenocorticotropic Hormone (ACTH) in Asthma.—Rose and co-workers treated 6 patients with severe asthma of three to eight years' duration with adrenocorticotropic hormone (ACTH). One of the patients in addition to asthma had pronounced rheumatoid arthritis, and another had periarteritis nodosa. The patients were hospitalized and placed on a diet of known caloric and electrolytic values. Nitrogen balance, urinary excretion of sodium, chloride, potassium, 17-ketosteroids, glycocorticoids, histamine and histidine were studied. On the last three days of a nine day control period, intramuscular injections of sterile water at intervals of six hours were administered. Treatment with adrenocorticotropic hormone was started on the tenth day with intramuscular injections in divided doses at six hour intervals. The first 2 patients received 150 mg. daily for two days and then 100 mg. for two more days, a total dose of 500 mg. The next 4 patients received 100 mg. daily for three days, 75 mg. daily for two days and 25 mg. on the sixth day of treatment, making a total dose of 475 mg. After the period of treatment, the patients were kept in a hospital for an additional three to five days, after which they were discharged and followed at regular intervals. There was a complete remission of all signs and symptoms in 4 patients within forty-eight hours after the initiation of the hormonal treatment. Complete remission was not achieved in the remaining 2 patients, although there was little doubt of improvement. With the need for epinephrine or other therapy removed, the pulse rate slowed down to normal and the patients experienced a sense of well-being and return of appetite. Respiratory function as evaluated by vital capacity and maximum breathing capacity was decidedly improved. In addition the ability of histamine or methacholine chloride to depress respiratory function during the control period was prevented in 4 patients after pituitary adrenocorticotropic hormone therapy. It is still too early to state how long a complete remission may be expected to last, but 1 patient remained completely clear of symptoms for one month. The signs and symptoms of rheumatoid arthritis and periarteritis nodosa were greatly improved in the 2 patients in whom these diseases were associated with asthma.

Cancer of Lip.—Burkell reports on 534 patients, 527 men and 7 women, between the ages of 22 and 86, with cancer of the lip. Four hundred and seventy-six patients were outdoor workers and 440 of them were farmers. Only 6 (1.1 per cent) had a positive reaction of the blood to the Wassermann test. The lower lip was the site of the lesion in 520 patients (97 per cent). Three hundred and forty-three patients had no history of preexisting lesions, 131 had such a history and 15 had significantly enlarged lymph nodes when originally seen. Epidermoid carcinoma was the histologic diagnosis in 529 patients: 481 were in stage 1 (less than 3 cm. in size); 35 in stage 2 (over 3 cm.); 15 in stage 3 with significant involvement of lymph nodes and 3 in stage 4. The 18 patients with malignant lymph nodes (stages 3 and 4) had delayed seeking medical attention for twenty-three months as compared to 4.8 months for the patient without lymph node involvement. In 16 patients malignant lymph nodes developed after successful treatment of the primary lesion. Recurrences were observed in 28 patients (5.2 per cent) six months to ten years after treatment of the original lesion. Forty-two of the 534 patients died of other causes, and 16 were lost to follow-up. Twenty-nine died as a result of cancer and 21 had a recurrence within five years, a total of 50 therapeutic failures. After five years or more 426 patients were free from disease; the over-all five year net survival was 89.5 per cent. The majority of patients were treated by either roentgen irradiation or radium implants. Cancer of the lip can be cured by radiotherapy in a high percentage of cases provided that treatment is instituted early. The choice of a particular radiotherapeutic technic is not important provided painstaking care is used in the planning and execution of the technic. This is necessary to minimize the recurrence rate and to insure good cosmetic results. Radiotherapy is not the treatment of choice for metastatically involved lymph nodes. Greater success may be obtained by a radical block dissection.

Serum Jaundice Transmitted by Tattooing Needle.—Roberts and Still report 4 cases of homologous serum jaundice transmitted by a tattooing needle to 3 aviation mechanics and 1 seaman. None of them had contact with clinical jaundice and none had an inoculation or venipuncture more recently than eight months before the onset of symptoms. The 4 patients were all tattooed on the same day and in the same establishment several months before illness. It is improbable that a small outbreak of infective hepatitis would be limited to such a group of persons. The incubation periods of 126, 132, 139 and 144 days were consistent with a diagnosis of homologous serum jaundice. It must be assumed that the tattooing needle was contaminated with the blood or serum of a customer who was either incubating serum hepatitis or suffering from a mild attack of that disease. Available evidence shows that only a minute quantity of serum is necessary to transmit the disease. If one assumes that the needle was involved, one must infer that the same needle was used on the infected customer and then on all 4 of the authors' patients in turn, a small amount of the infective material being inoculated into each. Since only a minute inoculum is necessary, there is nothing inherently improbable in the mode of transmission suggested by the authors. A plea is made for closer supervision of tattooing shops.

Cancer Research, Chicago

10:1-64 (Jan.) 1950

Studies on Relationship Between Sarcoma and Leukosis in Chickens: II. Histogenesis of Tumors Induced by Intramuscular Inoculation of Cell-Containing Leukotic Material. M. Pikovski and L. Doljanski. —p. 1.
Effect of Bromobenzene and 3,4-Benzpyrene on Metabolism of Radioactive L-Cystine. H. R. Gutmann and J. L. Wood.—p. 8.
Studies on Promoting Phase in Stages of Carcinogenesis in Mice, Rats, Rabbits, and Guinea Pigs. P. Shubik.—p. 13.
Studies on Intracellular Composition of Livers from Rats Fed Various Aminoazo Dyes. J. M. Price, E. C. Miller, J. A. Miller and G. M. Weber.—p. 18.
Intra-Ocular Transplantation of Heterologous Tissues. D. S. Morris, J. R. McDonald and F. C. Mann.—p. 36.
*Tobacco Smoking as Etiologic Factor in Disease: I. Cancer. R. Schrek, L. A. Baker, G. P. Ballard and S. Dolgoff.—p. 49.
Use of X-Rays to Determine Mitotic and Intermitotic Time of Various Mouse Tissues. N. P. Knowlton Jr. and W. R. Widner.—p. 59.

Tobacco Smoking and Cancer.—The smoking habits of 82 men with cancer of the lung and 73 men with cancer of the larynx and pharynx were compared by Schrek and his co-workers with the smoking habits of a control group of 522 patients with miscellaneous tumors. A relatively high percentage of cigaret smokers was found among the patients with cancer of the respiratory tract, as compared with the control group. This positive correlation between the incidence

of cigaret smoking and the incidence of cancer of the respiratory tract appeared to be both statistically and biologically significant.

Diseases of Chest, Chicago

17:1-124 (Jan.) 1950

*Cytologic Diagnosis of Bronchogenic Carcinoma. L. B. Woolner and J. R. McDonald.—p. 1.
*Bed Rest, Collapse and Streptomycin in Treatment of Pulmonary Tuberculosis: I. Clinical and Roentgenologic Observations (Preliminary Report). B. W. Armstrong, J. P. Colmore and J. E. Drorbaugh. —p. 11.
*Clinical Analysis and Follow-Up Study of 502 Cases of Carcinoma of Lung. W. F. Rienhoff Jr.—p. 33.
Intrathoracic Pheochromocytoma: Report of Case. R. H. Overholt, B. H. Ramsay and W. A. Meissner.—p. 55.
Metastatic Tumors of Lung. J. L. Marks.—p. 63.
Forty Years' Experience with Artificial Pneumothorax. A. J. Cohn. —p. 74.
Residual Cavities in Pulmonary Coccidioidomycosis: Follow-Up Studies. R. Berke, A. Schomer and H. E. Bass.—p. 84.
Pulmonary Edema: Experimental Observations on Dogs Following Acute Peripheral Blood Loss. R. M. Eaton.—p. 95.
Pulmonary Abscess as Complication of Hiatal Hernia. E. L. Coodley. —p. 102.

Bronchogenic Carcinoma.—Woolner and McDonald performed cytologic examination of sputum and bronchial secretions from approximately 6,000 patients. A cytologic diagnosis of carcinoma was made in more than 400 cases. The diagnosis was based on cytologic examination of sputum in approximately four fifths of the total number and on the examination of bronchial secretions, washings or smears made by direct swabbing of the bronchial wall in the remaining cases. False positive diagnoses were made in 2 per cent of the cases. The false negative error was about 30 per cent. Of the 400 patients, 144 underwent surgical exploration. Of the 144, 79 (54.9 per cent) had a preoperative microscopic diagnosis of carcinoma on the basis of positive results obtained on bronchoscopic biopsy. Positive smears provided the only preoperative microscopic evidence of malignant growth in the remainder. Pneumonectomy or lobectomy was performed on 77 patients, 45 of the operations being on the basis of positive biopsies and 32 on the basis of positive smears. The lesions were peripherally placed, showing slight or no communication between the tumor and the bronchial tree, in 8 of the 80 cases of surgically removed bronchogenic carcinoma. Cytologic examination of these peripherally located tumors gave negative results. Cytologic studies are of value in the diagnosis of alveolar cell tumor but not of bronchial adenoma or cylindroma.

Treatment of Pulmonary Tuberculosis.—Armstrong and co-workers treated 76 men aged 17 to 50 with pulmonary tuberculosis by bed rest and collapse therapy integrated with administration of streptomycin by the intramuscular route. The majority of the patients (63) received 1 Gm. of streptomycin daily for six weeks following an observation period of six weeks or more, during which the disease progressed, failed to improve, or improved less than was desired or expected. There were 6 patients with tuberculous lobular pneumonia without cavitation, 42 patients with advanced tuberculous lobular pneumonia and cavitation, 19 with confluent tuberculous lobular pneumonia, 5 with fibrocaseous and fibrocavernous subacute pulmonary tuberculosis and 4 with miscellaneous types. The results obtained were evaluated by a group of specialists (one phthisiologist, one pathologist and one thoracic surgeon), who observed that after treatment with streptomycin 54 patients (71 per cent) showed roentgenologic improvement, 63 (83 per cent) definite over-all clinical improvement and 45 (59 per cent) roentgenologic and over-all clinical improvement greater than could be expected without streptomycin. The disease was apparently arrested in 2 patients, quiescent in 13 and still active in 57. Forty patients were prepared for definite collapse therapy. Four patients died; 1 death occurred after pneumonectomy, 1 after tuberculous meningitis and 2 from steadily progressive pulmonary tuberculosis. The striking effect of streptomycin therapy was the rapid clearing of soft exudative spreads. The highly favorable response of confluent lobular pneumonia resulted from both the clearing of the perifocal reaction and the stimulation of the production of collagen by the invading productive elements. Acinose nodose foci showed a less dramatic decrease in size than the softer areas of caseous lobular pneumonia but showed more rapid healing after streptomycin therapy than was expected otherwise. It does not seem advisable to use streptomycin to prevent intracanalicular spreads.

Carcinoma of the Lung.—Rienhoff reports on 502 patients with carcinoma of the lung. There was a much higher incidence in men than in women, a ratio of almost 6 to 1 in favor of the men. The majority of the patients were in the fourth to sixth decade. Cough was the chief symptom in 71 per cent of the patients, hemoptysis in 63 per cent, and pain in 50 per cent, with a striking loss of weight in 39 per cent. Hyperpnea occurred in 23 per cent, pneumonitis in 18 per cent and fever in 13 per cent. Chest roentgenograms were positive in all 502 patients. Bronchoscopy was next in importance as an aid to definite diagnosis. Bronchography is a useful diagnostic method only to reveal occlusion of a bronchus by a small growth which does not produce a shadow in the roentgenogram. Transthoracic aspiration biopsy has a limited field and is often difficult to interpret. Exploratory thoracotomy should be resorted to far more frequently than it was in the past. Three hundred and forty-four patients were inoperable at the time of exploration. Total pneumonectomy was performed on 158 patients. Forty-one of the 158 patients died within less than one month, a total operative mortality of 26 per cent. Sixty-three of the patients who are now dead survived the operation for one month to six years, and 54 who are still alive survived from one month to sixteen years. Primary carcinoma of the lung can be satisfactorily treated by total pneumonectomy. Surgical measures short of pneumonectomy are not efficacious.

Florida Medical Association Journal, Jacksonville

36:393-456 (Jan.) 1950

The Circus. J. Halton.—p. 411.
Comments on Diverticula of Gastrointestinal Tract. G. Raap.—p. 415.
Toxic Effects of Tetraethylpyrophosphate: Report of Case. G. M. Johnson.—p. 417.
Clinical Application of Electrocardiography. F. A. Reed.—p. 420.
Reliability of Serologic Examinations as Performed in Medical Laboratories in Florida. A. V. Hardy.—p. 427.

36:457-528 (Feb.) 1950

Pyuria: Study of 100 Cases. F. J. Pyle.—p. 475.
Urologic Consideration of Urinary Incontinence in Female: Analysis of 112 Cases. A. J. Butt and W. E. Kittredge.—p. 479.
Multifocal Malignant Neoplasia: Case Report of Unusual Combination of Unrelated Cancers. L. Y. Dyrenforth and A. T. Kennedy.—p. 484.
Complications of Anorectal Surgery. T. E. Smith.—p. 488.

Indiana State Medical Assn. Journal, Indianapolis

43:1-84 (Jan.) 1950

Dynamic Therapy in Chronic Disease. D. A. Covalt.—p. 17.
Surgery of Large Arteries. L. G. Herrmann.—p. 21.
Thrombotic Obliteration of Aortic Bifurcation. F. W. Taylor and L. R. Nonte.—p. 29.
Tumor of Pineal Body with High Insulin Resistance. E. N. Mendenhall.—p. 32.

43:85-164 (Feb.) 1950

Hepatic Components in Various Physiologic Processes. F. C. Mann. —p. 101.
Streptomycin, Aureomycin, Chloromycetin and Their Application in Pediatric Practice. M. D. Garber.—p. 105.
Placenta Accreta: Discussion with Case Report. P. B. Arbogast. —p. 111.
Reaction to Overdosage of Privine: Report of 2 Cases. W. L. Owens. —p. 114.
Rare Finding Associated with Acute Appendicitis. F. E. Hagie. —p. 115.

Industrial Medicine and Surgery, Chicago

19: 1-48 (Jan.) 1950. **Partial Index**

Physical Deviations in 501 Consecutive Male Examinations. J. K. Martins.—p. 1.
*Inguinal Hernia: Delayed vs. Early Ambulation. O. J. Preston. —p. 6.
Occupational Adjustment of World War II Veteran at Atomic Energy Research Laboratory. J. S. Felton and M. D. Owen.—p. 13.
Appraisal of Industrial Hygiene. B. E. Kuechle.—p. 28.
Accidents—The Cancer of Industry. R. A. Sutter.—p. 31.
Dermatitis in Making of Chocolate Candy. M. H. Samitz.—p. 35.

Inguinal Hernia: Delayed Versus Early Ambulation.—Preston analyzed 200 consecutive cases of inguinal hernia, two identical groups of 100 cases each. The first group was handled according to the routine of complete postoperative bedrest for

not less than thirteen days. The second group was ambulatory early. They were not allowed to remain in their beds for more than twenty-four hours postoperatively. At first the initial adventure out of bed was generally limited to standing, with walking permitted only on the second postoperative day. During the past few years the patients were permitted to walk about on their first excursion out of bed and many walked to and used the hospital bathroom facilities. In each of the groups there were 80 with unilateral and 20 with bilateral hernia. Of the 200 patients, 179 had primary or previously unoperated on hernias and 21 had had surgical repair. Of the 179 primary cases 89 were in the group in which rising after operation was delayed and 90 in the group with early ambulation. The recurrence rate was practically identical in these two groups, 5 in each. Of those who had been operated on previously, 11 belonged to the delayed and 10 to the early rising group; there were 3 recurrences among the 11 and none among the 10 early rising patients. Simple postoperative complications amounted to 15 in the early rising and to 73 in the delayed group. The patients of the early rising group were discharged from the hospital six days sooner than the delayed group and returned to work two weeks earlier.

Journal of Allergy, St. Louis

21: 1-84 (Jan.) 1950. **Partial Index**

Experimental Approach to Psychosomatic Phenomena in Rhinitis and Asthma. S. Wolf, T. H. Holmes, T. Treuting and others.—p. 1.
*Studies on Effect of Administration of Pituitary Adrenocorticotrophic Hormone (ACTH) to Case of Loeffler's Syndrome and Case of Tropical Eosinophilia. P. Herbert, J. A. de Vries and B. Rose.—p. 12.
Poison Ivy: Summary of 100 Cases Treated with Aqueous (Alum Precipitated Pyridine) Extract. G. E. Gaillard.—p. 55.
Dermatitis Following Use of Pyribenzamine and Antistine. W. B. Sherman and R. A. Cooke.—p. 63.
Kaposi's Varicelliform Eruption: Report of Case Treated with Aureomycin and Observations Regarding Course of Underlying Skin Disease. R. Bookman.—p. 68.
Laboratory and Clinical Comparison of "Antihistaminic" Effect of Hydryllin and Four Experimental Compounds. D. J. Perry and P. LeVan.—p. 73.

Pituitary Adrenocorticotropic Hormone (ACTH) in Loeffler's Syndrome and in Tropical Eosinophilia.—Herbert and his co-workers describe the effects of pituitary adrenocorticotropic hormone (ACTH) in 2 patients with severe eosinophilia. They administered the hormone to a patient with Loeffler's syndrome and to a patient with tropical eosinophilia. The ACTH was given intramuscularly in divided doses. Totals of 140 mg. and 120 mg. were administered. A transient increase in total circulating leukocytes occurred in both subjects. There followed a decrease to virtual disappearance of circulating eosinophils in the patient with Loeffler's syndrome. In the case of tropical eosinophilia, however, although a decrease in total eosinophils occurred, the percentage decrease was much less and did not persist. It is not clear why there should have been such a great alteration in the eosinophils in Loeffler's syndrome and not in tropical eosinophilia. Although urinary corticoids or 17-ketosteroids were not determined, it is unlikely from clinical observations that the adrenal glands were abnormal in the patient with tropical eosinophilia. The difference in the response of the eosinophil count to ACTH in these two disorders might serve to differentiate them. There were many previous observations on the reciprocal relation between neutrophils and eosinophils. Leukocytosis is often accompanied with a reduction in the circulating eosinophils. Current thought on this phenomenon leads one to believe that this mechanism may be mediated through the pituitary adrenal mechanism. The blood histamine studies corroborate that the eosinophil in man is not responsible for carrying histamine. The common association of asthma in conjunction with Loeffler's syndrome and the presence of pulmonary as well as blood eosinophilia in asthmatic patients suggest that this cell must be intimately connected with the allergic state. Since ACTH or compound E affords a means of influencing this cell, it is possible that further studies with these compounds may help to clarify the mechanism of allergy and its relation to the pituitary adrenal axis.

Journal of Bone and Joint Surgery, Boston

32-A:1-234 (Jan.) 1950. **Partial Index**

Stabilizing Operations on Foot: Study of Indications, Techniques Used and End Results. R. L. Patterson Jr., F. F. Parrish and E. N. Hathaway.—p. 1.
Progressive Muscular Atrophy of Perioneal Type (Charcot-Marie-Tooth Disease): Orthopaedic Management and End-Result Study. J. E. Jacobs and C. R. Carr.—p. 27.
Fractures of Lateral Tibial Condyle. C. H. Bradford, R. M. Kilfoyle, J. J. Kelleher and H. K. Magill.—p. 39.
Arthrodesis of Hip Joint: Follow-Up Study. F. E. Stinchfield and W. U. Cavallaro.—p. 48.
Fractures of Calcaneus. G. E. Wilson.—p. 59.
*Prognosis in Poliomyelitis. R. E. Lenhard.—p. 71.
Surgical Division of Patellar Retinacula to Improve Extension of Knee Joint in Cerebral Spastic Paralysis. G. W. N. Eggers.—p. 80.
Pott's Paraplegia. G. J. Garceau and T. A. Brady.—p. 87.
Intervertebral-Disc Lesions in Children and Adolescents. J. A. Key.—p. 97.
Streptomycin in Tuberculous Bone and Joint Lesions with Mixed Infection and Sinuses. D. M. Bosworth, A. D. Pietra and R. F. Farrell.—p. 103.
Neuropathy of Median Nerve Due to Compression Beneath Transverse Carpal Ligament. G. S. Phalen, W. J. Gardner and A. A. La Londe.—p. 109.
Method of Mobilizing Temporomendibular Joint. H. Kelikian.—p. 113.
Trials and Tribulations in Attempted Femoral Lengthening. H. R. McCarroll.—p. 132.
End-Result Study of Keller Operation. M. Cleveland and E. M. Winant.—p. 163.
Osteomalacia. M. S. Sherman.—p. 193.
Transplantation of External Oblique Muscle for Abductor Paralysis. L. I. Thomas, T. C. Thompson and L. R. Straub.—p. 207.
Primary Tenorrhaphy of Flexor Tendons in Hand. V. E. Siler.—p. 218.

Prognosis in Poliomyelitis.—Lenhard presents a survey of the 1944 poliomyelitis epidemic in Maryland, which was the largest recorded in that state, with 499 cases (24.9 per 100,000 population). There were 16 deaths (3.2 per cent). The survey is a two year follow-up study and, although it represents the probable limit of improvement of muscles, it does not relate the end of the story of deformities. Wherever there is imbalanced power in antagonistic muscle groups, deformities can occur later. It was possible to compare 150 cases treated by nonsupportive methods with 150 cases treated by supportive methods. In the former series there were 35 deformities in 22 cases; in the latter, 19 deformities in 15 cases. Thus fewer deformities occurred in the cases treated by supportive therapy and physical therapy. The results of the 1941 and the 1944 epidemics were similar, except that slightly more patients had residual involvement in 1944. Approximately 80 per cent of the patients obtained a good recovery. Treatment should be carefully supervised and guided by muscle examinations. Supportive treatment is important. Delay in recovery and persistence of weakness have been observed in patients allowed to fatigue muscles by overtreatment, too much activity or lack of necessary support. Treatment given without regard to the protection of muscles results in more deformities.

Journal of Neurosurgery, Springfield, Ill.

7:1-96 (Jan.) 1950

*Intradural Spinal Granulomas. P. C. Bucy and H. R. Oberhill.—p. 1.
Surgical Treatment of Aneurysm of Anterior Cerebral and Anterior Communicating Arteries Diagnosed by Angiography and Electroencephalography. A. R. Elvidge and W. H. Feindel.—p. 13.
Studies on Sacral Reflex Arc in Paraplegia: I. Response of Bladder to Surgical Elimination of Sacral Nerve Impulses by Rhizotomy. A. M. Meirowsky, C. D. Scheibert and T. R. Hinchey.—p. 33.
Id.: II. Differential Sacral Neurotomy. Operative Method. A. M. Meirowsky, C. D. Scheibert and T. R. Hinchey.—p. 39.
*Meningioma of Optic Foramen as Cause of Slowly Progressive Blindness: Report of 3 Cases. W. McK. Craig and L. J. Gogela.—p. 44.
Four Congenital Tumors Found at Operation Within Vertebral Canal with Observations on Their Incidence. S. P. W. Black and W. J. German.—p. 49.
Root Pain and Paraplegia Due to Protrusions of Thoracic Intervertebral Disks. J. G. Love and E. J. Kiefer.—p. 62.
Drusen of Optic Nerve Simulating Papilledema. M. Chamlin and L. M. Davidoff.—p. 70.
Experience with Topectomy for Relief of Intractable Pain. J. Le Beau.—p. 79.

Intradural Spinal Granulomas.—According to Bucy and Oberhill intradural granulomas are rare. They may be of syphilitic origin in the form of a gumma, or tuberculomas, or they may be of other causes. The authors report a case of intradural spinal granuloma. The patient had a gradually progressive paraparesis with complete obstruction to the flow of cerebrospinal fluid and greatly increased cerebrospinal fluid

total proteins. Laminectomy revealed a granuloma compressing the thoracic spinal cord. This was partially removed. It was apparently tuberculous in origin, although no other foci of tuberculous infection were demonstrated. Its partial removal was followed by a complete recovery from all the symptoms of involvement or compression of the spinal cord. After three years there was no evidence of extension of the lesion or of the infection. Tuberculous meningitis did not develop. Since the differential diagnosis between granuloma and neoplasm is virtually clinically impossible, the first step should always be a laminectomy and decompression of the lesion and spinal cord. Later, antisyphilitic or other specific or supportive therapy may be administered. Although the prognosis cannot be regarded as good, the case of intradural granuloma of the spinal cord reported here is evidence that adequate decompression of the cord by laminectomy and partial removal of the granuloma may, on occasion, permit the body to overcome the infection with subsequent clinical recovery.

Meningioma of Optic Foramen Causing Blindness.—Craig and Gogela report 17 cases of primary intraorbital meningioma removed surgically and verified pathologically at the Mayo Clinic. Included in this group were tumors that arise from the meninges within the confines of the optic foramen and that subsequently tend to extend both intraorbitally and intracranially. The latter grow at an unusually slow rate and have a tendency toward bilateralism. The only symptom associated with the foraminate meningiomas is a slowly progressive blindness not accompanied with headache or pain. These foraminate meningiomas should not be confused with the small tumors arising along the mesial part of the sphenoid ridge and producing visual symptoms secondarily by their encroachment on the optic nerve. Meningiomas arising from within the optic foramen were removed surgically in 3 cases at the Mayo Clinic. In 2 the tumors were bilateral, and in the third it was unilateral. The tumors were psammous meningiomas, and all had exhibited an amazingly slow rate of growth. The presence of meningiomas attached to the sheath of the optic nerve may be explained adequately by the clusters or "caps" of arachnoidal cells occurring abundantly along the intraorbital course of the optic nerve. Review of these cases serves to emphasize that slowly progressive blindness, unaccompanied with headache or pain, is the only symptom to be expected in the presence of these tumors.

Journal Pharmacology & Exper. Therapy, Baltimore

98:1-120 (Jan.) 1950. **Partial Index**

Metabolic Effects of Anesthesia in Man: I. Acid-Base Balance During Ether Anesthesia. H. K. Beecher, L. Francis and C. B. Anfinsen.—p. 38.
Influence of 2,4-Dinitrophenol on Plasma Protein-Bound Iodine. J. Wolff, L. Rubin and I. L. Chaikoff.—p. 45.
Chemotherapy of Experimental Trypanosomiasis: I. Trypanocidal Activity of Certain Bis (2-Methyl-4-Amino-6-Quinolyl) Amides and Ethers. F. C. Goble.—p. 49.
Action of Sympathomimetic Amines on Central Nervous System and Blood Sugar: Relation of Chemical Structure to Mechanism of Action. A. Leimdorfer.—p. 62.
Effect of Liver on Metabolism of d,l-Methadone in Vitro and in Vivo. Chen-Yü Sung and E. Leong Way.—p. 72.
Distribution of Radiophosphorus in Rabbit Tissues After Injection of Phosphorus-Labeled Diisopropyl Fluorophosphate. B. J. Jandorf and P. D. McNamara.—p. 77.
Fate of Thiopental in Man and Method for Its Estimation in Biological Material. B. B. Brodie, L. C. Mark, E. M. Papper and others.—p. 85.
Fate of Antipyrine in Man. B. B. Brodie and J. Axelrod.—p. 97.

Kentucky Medical Journal, Bowling Green

48:1-41 (Jan.) 1950

Endometriosis with Particular Reference to Involvement of Sigmoid. A. E. Grimes Jr.—p. 20.
Why Examine Anus, Rectum, and Lower Sigmoid? W. L. Cooper.—p. 28.
Common Duct Stone. G. Y. Graves.—p. 31.
Ringworm of Scalp in School Children of Louisville. E. Kotcher and W. F. Lamb.—p. 34.

48:43-98 (Feb.) 1950

Changing Concepts in Cardiac Failure. F. B. Moosnick.—p. 49.
Significance of Jaundice. J. B. Floyd Jr.—p. 54.
Rheumatic Fever. T. G. Hobbs.—p. 57.
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Newer Antibiotics. A. S. Warren.—p. 74.

Psychosomatic Medicine, New York

11:249-326 (Sept.-Oct.) 1949

Formulation of Dynamics of Migraine Attack. R. M. Marcussen and H. G. Wolff.—p. 251.
Life Situations, Emotions, and Extrasystoles. I. P. Stevenson, C. H. Duncan, S. Wolf and others.—p. 257.
Special Features of Personality Which are Common to Certain Psychosomatic Disorders. E. F. Gildea.—p. 273.
Human Figure Drawing of Patients with Arterial Hypertension, Peptic Ulcer, and Bronchial Asthma. A. H. Modell and H. W. Potter.—p. 282.
Atopic Dermatitis: Psychosomatic Conference of Cincinnati General Hospital. A. Dunbar, M. Rosenbaum and R. Crede.—p. 293.
Factors in Pathogenesis of Peptic Ulcer: Critical Comments on Recent Article by George F. Mahl. T. S. Szasz.—p. 300.
Note of Concept of Cure. C. A. Seguin.—p. 305.
Psychiatric Observations Concerning Rhinoplasty. L. Linn and I. B. Goldman.—p. 307.

Radiology, Syracuse, N. Y.

54:1-156 (Jan.) 1950

Roentgen Therapy and Relief of Pain. F. W. O'Brien.—p. 1.
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Massive Calcification in Infarcted Myocardium. H. P. Brean, J. H. Marks, M. C. Sosman and M. J. Schlesinger.—p. 33.
Roentgen-Anatomical Studies of Normal Ileocecal Valve. F. G. Fleischner and C. Bernstein.—p. 43.
Fast Radiological Visceral Survey. C. Gianturco.—p. 59.
Improved X-Ray Phototimer. P. C. Hodges, R. T. Jenkins and S. F. Williams.—p. 64.
*Hidradenitis Suppurativa Axillaris: Analysis of 54 Cases Treated with Roentgen Rays. S. G. Schenck.—p. 74.
Unilateral Tuberculous Abscess of Thoracic Spine with Roentgen Findings of Dumb-Bell Neurofibroma. J. H. Kneidel, L. A. Smith and R. E. Bishop.—p. 78.
Spontaneous Renoduodenal Fistulas. J. D. King.—p. 82.
New Series of Radiopaque Compounds: II. Further Notes on Cholecystographic Uses of Certain Iodinated Hydroxyphenyl. B. S. Epstein, H. L. Cohen and S. Natelson.—p. 87.
Further Studies on Influence of Dose Fractionation on Lethal X-Ray Effect Produced by Total Body Irradiation in Mice. F. Ellinger and J. C. Barnett.—p. 90.
Further Studies on Relation Between Radiation Effects, Cell Viability, and Induced Resistance to Malignant Growth: VI. Anomalous Radiosensitivities of Analogous Mouse Mammary Adenocarcinomas. A. Goldfeder.—p. 93.

Roentgen Therapy of Hidradenitis Suppurativa Axillaris.—According to Schenck hidradenitis suppurativa is an inflammatory disease which has a predilection for certain regions of the body, such as the axillas, groins, breasts and perianal area. It is often diagnosed as abscess, furunculosis or carbuncle. Schenck reports on 58 cases of hidradenitis suppurativa axillaris. In the early stages a small hard mass is seen, resembling a boil or a furuncle, which undergoes suppuration. The furuncle either opens spontaneously or is lanced, leaving behind a hard marble-like nodule. In favorable cases this residual mass slowly heals. More commonly, the process spreads to areas near the primary focus. These new abscesses pass through the same stages as the original lesion. In the more advanced cases there may be undermining, burrowing, sinus formation and cordlike thickening in the axilla. The authors employed roentgen rays only. After the axillary hair has been removed, the axilla is irradiated with a 10 by 10 cm. cone at 50 cm. target-skin distance. In acute cases only 100 r (in air) are given, the dosage being increased as the severity of the disease diminishes. In the chronic types, 150 to 200 r (in air) are delivered at one sitting. The other technical factors are 180 kv. and 0.5 mm. copper and 1.0 mm. aluminum filtration. The half-value layer is 0.9 mm. copper. The axilla is thus irradiated three times a week for five to ten treatments, or a total of 1,000 to 1,200 r (in air). On the basis of the results obtained the author regards roentgen therapy as the most effective method of treating this condition.

Rhode Island Medical Journal, Providence

32:649-704 (Dec.) 1949

Epidermoid Carcinoma of Tongue: Study Based on 95 Cases. T. Perry Jr. and E. S. Cameron.—p. 663.
Undecylenic Acid Treatment in Psoriasis. W. B. Cohen.—p. 667.
Carcinoma of Endometrium. L. Parsons.—p. 668.
Degradation of British Medicine Under Socialism. C. Palmer.—p. 672.
Anesthesia in Cardiac Arrhythmias and Conduction Disturbances. E. Damarjian.—p. 674.

South Dakota Journal of Medicine, Sioux Falls

3:1-38 (Jan.) 1950

Histoplasmosis: Review of Recent Literature, and Presentation of 2 Cases. J. E. Harroun.—p. 1.
Cancer of Uterus: It's Earlier Diagnosis and More Effective Treatment. H. B. Hunt, E. S. Pederson and R. M. Coleman.—p. 5.
Lateral Spinal Curvature (Scoliosis) in Children. R. E. Van Dermark. —p. 13.
Rosebud Community Hospital at Winner, South Dakota. T. D. Crist. —p. 17.
Radiographic Examination of Urinary Tract. Sister Viola.—p. 20.

Surgery, Gynecology and Obstetrics, Chicago

90:1-104 (Jan.) 1950

Surgical Treatment of Complete Transposition of Aorta and Pulmonary Artery. A. Blalock and C. R. Hanlon.—p. 1.
Combined Radical Cervicofacial Procedures for Primary Facial Cancer. I. Macdonald.—p. 16.
*Premalignant Lesions of Ampulla of Vater. R. B. Cattell and L. J. Pyrtek.—p. 21.
Anatomy of Hernial Regions: III. Obturator Hernia and General Considerations. B. J. Anson, L. J. McCormack and H. C. Cleveland. —p. 31.
Effects of Injection of Penicillin, Peanut Oil and Beeswax, Separately and in Combination, upon Nerve and Muscle: Experimental Study. T. J. Holbrook and C. Pilcher.—p. 39.
*Angiocardiography in Thoracic Surgery. I. Steinberg, C. T. Dotter and W. DeW. Andrus.—p. 45.
*Consideration of Causes of Death Following Operation for Congenital Heart Disease of Cyanotic Type. H. T. Bahnson and R. F. Ziegler. —p. 60.
Arterial Anastomosis in Experimental Arterial Injury. A. D. Callow and C. S. Welch.—p. 77.
Occurrence of Epithelium and Glands of Intestinal Type in Gastric Mucosa. L. B. Arey and R. T. Bethe.—p. 86.
Closure of Patent Ductus by Suture-Ligation Technique. H. W. Scott Jr.—p. 91.
Inguinal Hernias, Absence of Uterus, and Pseudohermaphroditism. J. N. Ward-McQuaid and G. G. Lennon.—p. 96.
Use of Capsulectomy and Arthroplasty for Limitation of Finger Motion. F. L. Lichtolt.—p. 103.
Experiences with Cardiac Arrest. F. H. Lahey and E. R. Ruzicka. —p. 108.

Premalignant Lesions of Ampulla of Vater.—Cattell and Pyrtek report 2 instances of benign papilloma which produced symptoms and objective signs of obstruction of the common duct. They report 4 cases of malignant lesions to emphasize the importance of the premalignant status of these benign lesions. Cancer of the ampulla, which frequently arises in such lesions, is usually of low grade malignancy, metastasizes late and gives early symptoms, which lead to early diagnosis and treatment by radical pancreatoduodenectomy. The benign lesions are relatively common, are important in the production of symptoms and are a source of malignant disease. These benign lesions should be suspected in patients who have had a cholecystectomy with a recurrence of symptoms. These lesions are small. In most instances they can be diagnosed, if symptomatic, at operation by mobilization of the duodenum and head of the pancreas for accurate palpation and by duodenotomy with direct visualization of the ampulla of Vater. One can diagnose carcinoma of the ampulla and head of the pancreas at operation by observing the dilatation of the extrahepatic biliary tree, by dilatation of the duct of Wirsung and by mobilization of the duodenum and head of the pancreas for accurate palpation of the ampulla and head of the pancreas.

Angiocardiography in Thoracic Surgery.—Steinberg and his associates used angiocardiography in aneurysms, dermoid, pericardial and bronchogenic cysts, thymic tumors, the lymphomas, bronchogenic carcinoma and chronic pulmonary inflammation, including tuberculosis and bronchiectasis. They found this to be an important ancillary method in the study of any thoracic surgical problem. The information which it yields is of great value in diagnosis, in determining operability and in the planning and carrying out of the surgical attack. Data obtained by angiocardiography are most valuable when added to the routine roentgenographic studies, including fluoroscopy, conventional roentgenograms in various positions and esophagrams and bronchograms when indicated. The demonstration of the safety of angiocardiography in over 1,000 cases indicates that it should be used routinely except in the few instances with contraindications, such as sensitivity to iodine-containing radiopaque compounds or severe renal disease.

Causes of Death Following Operation for Congenital Heart Disease.—Bahnson and Ziegler say that between Nov. 30, 1944, and Sept. 25, 1947, 500 patients with congenital heart disease and cyanosis were operated on in Johns Hopkins Hospital by Blalock and his associates. Of these 500 patients 99 are dead. In the 358 patients in whom the preferred operation was done, namely, a subclavian pulmonary end to side anastomosis, the mortality rate was 12.6 per cent. Twenty-two of the patients died as a result of cerebral complications. Cardiac failure and pulmonary edema accounted for 15 deaths. Hemorrhage was responsible for 7 deaths. It is felt that the main bleeding was from the collateral vessels and not from the anastomosis. Thrombosis of the anastomosis is a rare complication (5 cases), and for this reason anticoagulants are not used prophylactically. Respiratory complications were responsible for only 4 deaths. Two deaths resulted from operative shock. Twenty-three patients died from miscellaneous causes. The authors feel that the seemingly forbidding mortality rate of 1 patient in 5 must be balanced against the generally poor prognosis of patients with congenital heart disease and cyanosis. No patient has been denied operation because of the severity of his illness, and several have died while in the hospital awaiting operation. Regardless of complicating features, parents and adult patients ask that the operation be attempted even when informed of the risk. The preferred age for operation is between 2 and 12 years, inclusive. Prior to this period compensatory mechanisms are still developing and the operative procedure is more difficult because of small structures. Beyond the age of 12 the distance between the systemic and pulmonary arteries is likely to be out of proportion to the length of the subclavian artery and one is more often required to use the carotid artery or to do an end to end anastomosis.

West Virginia Medical Journal, Madison

46:1-30 (Jan.) 1950

Use of Cholinergic Agent in Diagnosing Borderline Cardiac Disease. I. E. Buff.—p. 1.
Significance of Hematuria. R. M. LeComte.—p. 4.
*Pulmonary Function Studies in Bituminous Coal Miners. H. L. Motley. —p. 8.

46:31-54 (Feb.) 1950

Medical Care in Atomic Age. H. C. Lueth.—p. 31.
Pyranisamine Maleate, Its Use in Treatment of Common Cold in Young Children. J. M. Brewster and T. A. Anderson Jr.—p. 36.
Pitressin and Myocardial Infarction. F. R. Whittlesey.—p. 38.
Allergic Manifestations of Eye. C. T. St. Clair Jr. and B. W. Bird. —p. 39.

Pulmonary Function in Bituminous Coal Miners.—Motley obtained measurements of ventilation, emphysema and the respiratory gas exchange in 56 bituminous coal miners with anthracosilicosis. These findings were compared with those in previous studies made on anthracosilicotic anthracite coal miners. The disturbances of respiration in anthracosilicosis were similar in bituminous and anthracite miners. The chest roentgenogram was poorly correlated with the changes in function. Measurements of vital capacity, maximal breathing capacity, residual air and the degree of emphysema, efficiency of the lungs for oxygen uptake, arterial blood oxygen saturation and the duration of dyspnea after exercise were the most important tests in evaluation of the impairment. In some cases measurements on the pulmonary circulation are necessary. The resting arterial oxygen saturation alone was poorly correlated with pulmonary function impairment, because the respiratory gas exchange measurements might be essentially normal at rest although during exercise gross abnormalities became manifest. A significant degree of pulmonary emphysema occurred in about two thirds of the cases. Fibrosis may result in disability by decreasing ventilation capacity and producing unequal alveolar aeration and perfusion (distribution factor). This unequal alveolar aeration and perfusion, rather than a true diffusion difficulty, is primarily responsible for the increased oxygen gradient between the alveoli and the arterial blood. The limitation of compensatory hyperventilation produced most of the subjective complaints of dyspnea.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

34:1-64 (Jan.) 1950

Electroretinography of Experimental Animals. J. W. Waters.—p. 1.
*Treatment of Infected Corneal Ulcer by Subconjunctival Injection of Penicillin in Doses of 1,000,000 Units. A. Sorsby and R. A. Burn. —p. 16.
Aureomycin in Ophthalmology (Preliminary Report). S. Duke-Elder, D. Ainslie and A. J. Boase.—p. 30.
Injection of Retinal Vascular System in Enucleated Eye in Diabetic Retinopathy. N. Ashton.—p. 38.
Convergence Deficiency: Investigation into Results of Treatment. A. Mellick.—p. 41.
Contribution to Theory of Vascular Origin of Glaucoma. E. Dienstbier, J. Balik and H. Kafka.—p. 47.

Subconjunctival Injection of Penicillin.—According to Sorsby and Burn adequate concentrations of penicillin can be obtained in the cornea and aqueous by subconjunctival injections. Originally a dose of 50,000 units was used. Subsequently the dose was increased to 500,000 units in one injection at 24 hour intervals. The authors treated 30 patients with infected corneal ulcer, generally complicated by hypopyon, with doses of 1,000,000 units at 24 or 48 hour intervals. A dose of 1,000,000 units of white crystalline penicillin, the only kind to be used for this purpose, dissolves in 1 cc. of water or in 0.5 cc. of water and 0.5 cc. of epinephrine (1 : 1,000). If severe iritis is present, a mydriatic incorporated in the solvent will induce rapid mydriasis. A smear and culture from the conjunctival sac should be taken and an epinephrine sensitivity test done. If a subcutaneous injection of 2 minims of epinephrine 1 : 1,000 gives no unpleasant reaction within 15 minutes, it may be assumed that no harm will result. The patient should be given a subconjunctival injection of 1,000,000 units of white crystalline penicillin in a solution containing epinephrine, a mydriatic and distilled water. No treatment is needed during the first 24 hours beyond keeping the eye bandaged and instilling atropine to maintain mydriasis. If the condition shows improvement, a further injection should not be needed until 48 hours after the first, but in severe infections it may be wise to give the second injection after 24 hours. If after three or four injections it proves difficult to continue with subconjunctival injections, the retrobulbar route may be used. In 17 of the 30 cases the eye had been healthy previous to the onset of the infected corneal ulcer. In 14 the response was prompt, and in most of these cases one injection would probably have been adequate. In the 3 patients not responding to penicillin, the corneal ulcer was due to bacilli insensitive to penicillin. In the 13 cases of infected corneal ulcer in previously diseased eyes the result of treatment was satisfactory in 9. The described treatment brings the condition under control within 24 hours in most cases. Corneal scarring is minimal and the visual results gratifying.

Lancet, London

1:53-98 (Jan. 14) 1950

Early Yield of Human Milk, and Its Relation to Security of Lactation. H. Waller.—p. 53.
Penicillin in Tissue Exudates After Injection. J. Ungar.—p. 56.
*Treatment of Tuberculous Meningitis with Streptomycin. S. J. M. Russell and P. MacArthur.—p. 59.
Influenza in Isolated Community: Epidemic on Ocean Island. A. Isaacs, M. Edney, M. Donnelley and M. W. Ingram.—p. 64.
Pemphigus Vulgaris Treatment with Aureomycin. F. R. Bettley. —p. 66.
Carbon Tetrachloride Poisoning. R. W. E. Watts.—p. 66.
Fixed Skin Eruption Due to Phenytoin Sodium. R. D. Sweet.—p. 68.
Reduction of Supracondylar Fractures of Humerus with Backward Displacement. J. J. Shipman.—p. 68.
Fatal Chronic Tracheobronchitis Due to Pseudomonas Pyocyanea in 2 Siblings. J. R. O'Brien.—p. 69.
Urinary Excretion of Phenobarbitone: After Single Large Dose. A. Thompson.—p. 70.
Urinary Incontinence Cured by Operation: Uncommon Case. M. Kenny.—p. 71.
Volvulus of Small Intestine: Position of Relief. R. E. B. Tagart. —p. 71.

Streptomycin in Tuberculous Meningitis.—Russell and MacArthur present observations on 33 children who were given streptomycin for tuberculous meningitis at the Royal Hospital for Sick Children in Glasgow between January 1947 and September 1949. At the beginning of the trials large doses were given both intramuscularly and intrathecally and were temporarily stopped on the appearance of toxic effects. Later two schemes of treatment were evolved. Scheme A begins with a twelve week course of continuous intramuscular treatment: intrathecal injections are given daily during the first, third and sometimes the fifth weeks of the schedule. For the remainder of the period injections are given once a week into the subarachnoid space. After the initial twelve week course further treatment is not given unless indicated by the clinical condition or by a rising cell count in the cerebrospinal fluid. Scheme B consists of three or sometimes four separate periods of treatment, each lasting four weeks, with intervals of fourteen days. Throughout each of these periods intramuscular treatment is given daily. During the first period intrathecal injections are given daily for the first week and on alternate days for the remainder of the period; during the second period the intrathecal injections are given on alternate days; during subsequent periods they are given once weekly. Experience suggests that long intensive intrathecal treatment is unnecessary. Eighteen of the 33 children are dead, 10 alive and well, and 5 alive but disabled. The prognosis is relatively good in patients treated with streptomycin at an early stage of the disease, when the child is over the age of 2 years, and when a "snowstorm" roentgenogram of the lung and choroidal tubercles are absent. If the child is under the age of 2 years, has had meningitis for more than seven days or shows a "snowstorm" lung, choroidal tubercles or a spinal or tentorial block the prognosis is poor.

1:99-144 (Jan. 21) 1950

*Postoperative Paralysis in Upper Extremity: Report of 5 Cases. M. R. Ewing.—p. 99.
Brachial Plexus Lesions After Cholecystectomy. L. G. Kiloh.—p. 103.
Aetiology and Treatment of Auricular Flutter. D. H. Makinson and G. Wade.—p. 105.
Arsine Poisoning in Industry: Report of Case. M. Steel and D. V. G. Feltham.—p. 108.
Severe Urticaria Complicating Streptomycin Therapy. D. C. Lindars. —p. 110.
Exfoliative Dermatitis Complicating Streptomycin Therapy. W. C. Harris and R. V. Walley.—p. 112.
Acute Diverticulitis of Caecum and Ascending Colon. R. E. Shaw and J. Siegler.—p. 114.
Relapse in Typhoid Fever After Treatment with Chloramphenicol. J. N. Briggs.—p. 115.
Abnormality in Steroid Metabolism Associated with Rheumatoid Arthritis. I. F. Sommerville, G. F. Marrian, J. J. R. Duthie and R. J. G. Sinclair.—p. 116.

Postoperative Paralysis in the Upper Extremity.—Ewing has encountered a number of cases of postoperative palsy of the upper extremity, in 2 of which the condition was widespread and severely incapacitating. The distress caused the patient by this avoidable disability has been considerable. The risk of such paralysis was known at the turn of the century, but it is the author's impression that the incidence has increased in recent years. The wide use of curare may be partly responsible for the prevalence of this complication. He presents evidence that stretching of brachial nerve trunks is an important factor. The Trendelenburg tilt combined with abduction at the shoulder is a dangerous maneuver. In many operations it is necessary to use an arm vein for injection of drugs or infusion of blood or isotonic sodium chloride solution; often the arm is raised and secured to an arm board for this purpose. This occurred in all 5 of the author's cases.

Medical Journal of Australia, Sydney

2:901-928 (Dec. 24) 1949

Tuberculosis Survey of Children in Provincial City. K. G. Kerr. —p. 901.
*Hydatid Disease of Vertebrae. L. J. Woodland.—p. 904.
Prolapse of Nucleus Pulposus in Cervical Region, Accompanied by Compression of Spinal Cord, with Report of Case. J. Isbister.—p. 910.
Report of Case of Cerebro-Spinal Meningitis Due to Cryptococcus Histolytica (Torula Hominis). L. W. Alderman.—p. 914.

Hydatid Disease of Vertebrae.—The frequency of hydatid disease of bone has been estimated at between 0.59 and 2.24 per cent. The common sites affected are the vertebrae, the pelvis, the femur and the humerus. The vertebrae are the most frequently affected bones, representing 50 per cent of the cases. The spongy tissue of the vertebral bodies is a favorite site when

hydatid disease attacks a bone. The infection, as with hydatid disease elsewhere, usually starts in childhood. While it is confined to the bone, the growth of the hydatid is so slow that symptoms do not become evident before adult life. In the cases reviewed the average age when symptoms occurred was 34 years. There are no symptoms until the destruction of the bone leads to fracture or dislocation or until the hydatid cyst has erupted from the bone and caused pressure or swelling. In 4 of the 5 cases reviewed by Woodland there were symptoms of pressure on the spinal cord. Four of the patients died, the average duration of life after the onset of symptoms being 11 years. The original site of infection in 3 cases was the upper lumbar vertebra and in 2 cases the midthoracic vertebra. The diagnosis of vertebral hydatid disease is difficult. The general condition is usually excellent. Symptoms are due to fracture or subluxation of the affected vertebra or to pressure by extraosseous extensions, which may be confused with lipoma or cold abscess. Although vertebral hydatid disease has no pathognomonic radiologic signs, certain features, such as absence of periosteal reaction, minimal collapse, slight involvement of intervertebral spaces only, increased density of bone together with areas of destruction and involvement of contiguous ribs when a thoracic vertebra is affected aid in the diagnosis.

Tubercle, London

30:265-288 (Dec.) 1949

What is Atelectasis? C. Xalabarder.—p. 266.

31:1-24 (Jan.) 1950

*PAS in Pulmonary Tuberculosis. J. Lehmann and others.—p. 2.
Tuberculosis Services of Future. F. Heaf.—p. 11.

Paraaminosalicylic Acid in Pulmonary Tuberculosis.—Lehmann and associates report on results obtained with paraaminosalicylic acid in six sanatoriums for tuberculous patients in Sweden. The diagnosis of tuberculosis was definitely established in patients selected for treatment, and the pulmonary process was either progressive or stationary but not regressive. The disease was moderately or far advanced and the patient given ordinary sanatorium care for at least two months. An average of 14 Gm. paraaminosalicylic acid a day, in four to six doses was given orally. The treatment was continued for at least one month, and the patient was observed for at least three months. The authors analyze results obtained in 378 cases, including 205 selected cases. The most impressive effect was seen in the lowering of the temperature, sedimentation rate, gain in appetite and weight and the general condition of the patient. The changes usually began one to three weeks after treatment with the drug was begun. The simultaneous decrease in sputum and conversion together with regression in the pulmonary infiltrations and cavities further increased the impression that treatment with paraaminosalicylic acid converges a progressive phase of the disease into a healing phase.

Acta Chirurgica Belgica, Brussels

48:421-520 (Oct.) 1949. **Partial Index**

Contribution to Surgical Pathology of Small Intestine; Ileitis and Aspecific Granulomas. A. de Scoville.—p. 421.
*Use of Whole Skin Grafts in Treatment of Hernias and Eventrations: Late Results. Lessons to be Derived from Two Reinterventions. A. Dumont and M. van der Ghinst.—p. 456.

Skin Grafts for Hernias and Eventrations.—Dumont and van der Ghinst used whole skin grafts in the repair of hernia and eventration in 22 patients between the ages of 24 and 75 years. Thirty-one grafts were applied to these patients, 8 of whom had unilateral hernia, 12 bilateral hernia and 2 eventration. There was no operative death and no postoperative complication except phlebitis in 1 patient. Seven patients were lost from observation, and 15 patients, with 22 grafts, were followed. Satisfactory results were obtained in 4 of 5 patients with unilateral hernia. Twelve of sixteen grafts in 9 patients with bilateral hernia and one graft in a patient with eventration were satisfactory. Grafts were again applied in 2 of the 5 recurrences. In contrast to Mair's assertion, the pilosebaceous follicles had not undergone degeneration and not the slightest intolerance was manifested. These observations suggest that special care should be given to the closure of the hiatus of the graft. Whole skin grafts are recommended for, and should be restricted to, repair of hernias with severely weakened posterior wall of the inguinal canal.

Archiv für Kinderheilkunde, Stuttgart

138:1-64 (No. 1) 1949. **Partial Index**

Pathogenesis of Meconium Ileus. W. Zischka.—p. 1.
Evaluation of Blood Transfusion in Dystrophic Suckling Infants: Clinical-Statistical Study. D. Roland.—p. 4.
Statistical Studies on Relation Between Scarlet Fever Susceptibility and Body Weight: Role of Malnutrition. F. Küster and H. Goedecke.—p. 27.
*Therapy of Meningitis Caused by Bacterium Coli in Suckling Infants. E. Grundler.—p. 43.

Therapy of Meningitis in Infants.—Grundler reports 2 cases of meningitis caused by Escherichia coli, in 1 infant aged 8 weeks and in 1 aged 10 weeks. The younger infant was given 12,000 units of penicillin every three hours by the intramuscular route (total 1,500,000 units) followed by 100,000 units by the intrathecal route. Penicillin therapy was combined with oral administration of sulfathiazole and a mixture of equal parts of sulfamerazine and the 4-aminomethylbenzene sulfonamide salt of sulfathiourea. The older infant was given 2 courses of penicillin with a total of 2,400,000 units by the intramuscular route and 140,000 units by the intrathecal route. Penicillin was combined with oral administration of sulfonamide compounds. Streptomycin was administered in doses of 0.1 Gm. two times daily by the intrathecal route during the interval between the two courses of penicillin. Both infants made a complete recovery. The result is noteworthy because in vitro penicillin seems to have no effect or to affect only certain strains of Esch. coli. There is also the possibility that the salutary results were due to the sulfonamide compounds and to the intrathecal therapy.

Deutsche medizinische Wochenschrift, Stuttgart

74:1485-1516 (Dec. 9) 1949. **Partial Index**

*Cerebral Disease in Relation to Gastric Ulcer. M. Staemmler.—p. 1485.
*Skin Lesions Due to Handling or Treatment with Streptomycin. K. H. Schäfer and E. Oppermann.—p. 1491.
Cytodiagnosis of Malignant Tumors: Smears from Gastric Mucosa. S. Sandkühler and H. J. Streicher.—p. 1496.
Significance of Physiology of Hearing for Practice of Cardiac Auscultation. K. Holldack.—p. 1497.

Cerebral Disease and Gastric Ulcer.—Staemmler investigated the neurologic and neurosurgical necropsy material at his hospital for erosions and ulcerations in stomach and duodenum. Among 36 patients with acute fatal brain lesions (operations on the brain, suppurating meningitis, encephalitis and the like), there were 10 with erosions of recent date in the stomach or duodenum. These cases do not include observations on the newborn. Among 50 cases with chronic brain lesions (old injuries, abscesses and tumors), only 1 had a scar in the duodenum; a recent, still active ulcer was never observed. Evidence indicates that the gastroduodenal erosions which exist in the presence of severe cerebral lesions are the result of a centrally induced circulatory disturbance, which begins with hyperemia and develops into hemorrhagic infarction. The mucosa thus damaged is eroded by the gastric juice. A causal connection exists between the cerebral lesion and the erosion in stomach or duodenum, which may be limited to the mucosa or may penetrate the entire wall and lead to perforation. In some cases a hemorrhage in the mucosa may be sufficient to reduce resistance to the digestive action of the gastric juice. Such hemorrhages of central origin are known to occur also in the lung and in the mucosa of the bladder. It is difficult to ascertain whether the erosions of central origin may develop into true chronic ulcers. The author believes that this is the exception and that the erosions usually heal when the cerebral irritation subsides. His investigations provided no proof that true chronic gastric or duodenal ulcers developed from the centrally induced erosions.

Skin Lesions Resulting from Handling of Streptomycin.—Schäfer and Oppermann discuss skin lesions occasionally observed in physicians and nurses who handle streptomycin or in patients who have been treated with the drug. The dermatitis usually involves the hands and occasionally the region of the eyes; in severe cases it may involve extensive areas of skin. One may prevent such attacks or may reduce their intensity

after they have developed by wearing rubber gloves and goggles while handling streptomycin. In severe sensitivity it may be necessary to avoid all contact. If the dermatitis develops in patients it is seldom severe enough to require treatment or the interruption of the administration of streptomycin.

Finska Läkaresällskapets Handlingar, Helsingfors

92:1-198 (No. 1) 1949. **Partial Index**

Nuclear Physics and Medicine: II. Contribution of Nuclear Physics to Medicine. H. Zilliacus.—p. 49.
Anesthesia in Childbirth. R. Jåfs.—p. 98.
Leukocyte Picture in Acute Grave Gastroenteritis and Intoxication in Infants. P. Forssell.—p. 115.
*Abdominal Aortography. B. Lindström.—p. 123.
Solitary Massive Splenic Cysts. H. E. Blomquist.—p. 135.
Concretions in Pancreas: Review in Connection with 2 Cases. G. F. Saltzman.—p. 159.

Abdominal Aortography.—Lindström has applied Dos Santos' technic for aortography in 50 patients, all under intravenous anesthesia, which is preferable to spinal anesthesia. Sodium iodomethamate in 75 per cent solution as the contrast medium gave satisfactory results. Serious complications did not occur. There were 42 cases of organic vascular disease in the lower extremities. In 2 cases complete obliteration of the abdominal aorta immediately below the inferior mesenteric artery was diagnosed, and in 13 complete obliteration of one of the common iliac arteries. In 8 cases aortography was used in diagnosis of abdominal tumors and renal disease, partly as a supplementary method of examination, partly as the decisive method of diagnosis. The author finds aortography a valuable method of examination in advanced arterial disease of the lower extremities and an aid to diagnosis in obscure abdominal tumors and renal disorders. He considers puncture of the aorta in experienced hands as simple a procedure as lumbar puncture and hardly more of a risk for the patient. The iodine sensitivity of the patient should be tested in all cases of aortography.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

93:4009-4076 (Nov. 26) 1949. **Partial Index**

*P. T. (Phosphate Toxoid): New Toxoid for Diphtheria Prophylaxis. A. L. Noordam, A. C. Brandwijk, A. Tasman and W. A. Timmerman. —p. 4014.
*Intravenous Iron Therapy in Hypochromic Anemia. J. Gerbrandy. —p. 4020.
Pharmacologic Aspects of Iron Saccharate Solution for Intravenous Therapy. O. M. de Vaal and M. J. Diepenhorst.—p. 4029.
Preparation of Iron Saccharate Solution for Intravenous Therapy. J. C. de Jong and J. B. Lenstra.—p. 4033.
Hyperthyroidism in Children. D. P. R. Keizer.—p. 4037.

Phosphate Toxoid in Prophylaxis in Diphtheria.—Noordam and his co-workers say that the phosphate toxoid prepared by the Institute for Public Health in Utrecht consists of a diphtheria toxoid prepared by ultrafiltration and extraction with ammonium sulfate and adsorbed on aluminum phosphate. This new toxoid (phosphate toxoid) was tried in 67 adults, who were given either two injections of 0.5 cc. each or one of 0.5 and one of 0.2 cc. Sixty-four of these persons were completely immunized. Reactions were slight. The phosphate toxoid was used in Amsterdam in two groups of children, numbering 154 and 73. Immunization was successful in 151 and 72, respectively, that is, in more than 98 per cent. The reactions were slight.

Intravenous Iron Therapy in Hypochromic Anemia.—Gerbrandy treated 9 patients with severe hypochromic anemia with intravenous injections of a solution of ferrum saccharatum. This preparation had an iron content of 2 per cent, and each injection provided 100 to 200 mg. of iron. Injections were given for ten to fourteen days. The total dose of iron was 1,200 to 2,000 mg. The result was a rapid increase in the hemoglobin content of 1 to 4 per cent per day and the reticulocyte crises varied between 6 and 25 per cent. The blood volume increased simultaneously in 2 out of 3 patients. Thus the increase in hemoglobin was even greater than was indicated by the hemoglobin content. Thrombosis of injected veins, the development of painful infiltrations as the result of paravenous injection, hemolysis and general vascular reactions after too rapid injection were undesirable complications, but these could be largely prevented by slow injection and by employment of different veins for consecutive injections.

Revista de la Asociación Méd. Argentina, Buenos Aires

63:577-620 (Dec. 15-30) 1949. **Partial Index**

*Benign Chondrosteoblastoma. O. Copello.—p. 577.
Multiple Laryngo-Tracheo-Bronchial Tuberculous Polyposis. J. Jiménez Herrero and A. E. Bence.—p. 605.

Benign Chondrosteoblastoma.—Copello reports on 54 patients with benign chondrosteoblastoma. Trauma or surgical intervention on the benign tumor in 4 patients caused the tumor to develop into a secondary malignant osteoblastoma, malignant chondrosteoblastoma, malignant mixoblastoma or a malignant fibroblastoma. The giant variety of the tumor, not previously described, was observed in 7 patients. The giant tumor is painless and benign but may become malignant. The tumor is sessile, with a wide base, and grows rapidly from the cartilage, up to the size of a child's head. Local pain, heat and a venous network indicate transformation of a benign tumor into a malignant one. The roentgen diagnosis is made by the changes in the tumor shadow, showing irregular borders, break in the continuity of the tumor with the bone in which it originated and infiltration into the soft tissues. Calcification of the cartilage is frequent. The differential roentgen diagnosis between the benign and malignant giant tumor should be confirmed by biopsy. These tumors do not respond to roentgen therapy. Treatment is not necessary as long as they are symptomless and benign. Surgical removal of a benign giant chondrosteoblastoma is indicated: (1) when the tumor is very large; (2) if it causes displacement or changes in the adjacent bone or causes functional disorders, and (3) for esthetic reasons. The operation should be as conservative as possible. If the continuity of a large bone is interrupted during the removal of a huge tumor, a bone graft should be immediately placed. Transformation of a benign giant chondrosteoblastoma into a malignant tumor calls for amputation of the limb. A diagnostic error about the character of the tumor may lead to an unnecessary mutilation or to a dangerous delay in performing the operation.

Ugeskrift for Laeger, Copenhagen

111:1467-1492 (Dec. 29) 1949. **Partial Index**

*Treatment of Pneumonia in Children with Single Massive Doses of Sulfathiazole. C. Friderichsen and T. Walther.—p. 1467.
*Treatment of Pneumonia in Children. H. Buch.—p. 1476.
Diphtheria-Tetanus Vaccination and Prophylactic Treatment of Lesions in Patients Vaccinated Against Tetanus. I. Scheibel.—p. 1480.

Treatment of Pneumonia in Children with Massive Dose of Sulfathiazole.—Friderichsen and Walther report on 875 cases of pneumonia in children treated with a single massive dose of sulfathiazole. No injurious effect was noted on the blood or kidneys. The dose was 0.30 Gm. sulfathiazole per kilogram of body weight. When the body weight exceeded 13 Kg. the maximal dose was 4 Gm. (with 5 Gm. in exceptional cases). In severer pneumonia the massive dose sometimes had to be repeated after 24 to 48 hours. As a rule the temperature fell in 12 to 24 hours after administration of the drug. One and a half hours after administration the sulfathiazole concentration in the blood was about 5 mg. per hundred cubic centimeters and four hours afterward, about 10 mg. per hundred cubic centimeters. The total mortality was 4.9 per cent. Excluding the patients who were moribund on admission and those with congenital defects, the mortality was 0.46 per cent and, excluding only the cases with congenital defects, 2.46 per cent. The authors assert that a massive dose gives better results than continuous treatment and is easier to administer.

Pneumonia Treatment in Children.—Of 554 children with pneumonia, of whom 236 were aged less than 1 year, 211 were treated with a single massive dose of sulfathiazole, 69 with two massive doses and 274 with one massive dose and penicillin. The total mortality was 6.1 per cent. Of the 33 deaths 31 were among children under 1 year of age; 15 deaths were due to pneumonia, and 18 to complicating diseases (congenital heart disease, acute malignant tracheobronchitis, grave malformations). Buch finds that the treatment with one massive dose of sulfathiazole, or sulfathiazole and penicillin, gives better results than continuous treatment and that the complications are few and unimportant. The decrease in temperature is usually rapid. The practical advantage of a single dose makes the treatment well suited for children.

Book Notices

THE REVIEWS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES AND DO NOT REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED.

A History of Oto-Laryngology. By R. Scott Stevenson, M.D., F.R.C.S., and Douglas Guthrie, M.D., F.R.C.S. Cloth. $5. Pp. 155, with 52 illustrations. Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1949.

The authors claim that this is the first history of the specialty of otolaryngology, although they do credit previous works on otology and laryngology, several of which are mentioned. Nevertheless their little volume is a welcome addition to the literature because it covers everything of importance in the origin and development of the specialty. Beginning with the earliest references to diseases of the ear, nose and throat as described in the papyri of Ebers and Smith, they carry the story through the Middle Ages and the Renaissance to the development of otology as a science, the education of the deaf and the founding of laryngology and otology as they are known today. Many brief biographic sketches add interest to the narrative.

The work represents a great deal of research which has been thoroughly condensed into a volume of minimal size but maximal content. An extensive bibliography and complete index add considerably to its value. It is a well documented record that every otolaryngologist may read with profit and pleasure.

The 1949 Year Book of Radiology (June, 1948-June, 1949). Radiologic Diagnosis, edited by Fred Jenner Hodges, M.D., Professor and Chairman, Department of Roentgenology, University of Michigan, Ann Arbor, and John Floyd Holt, M.D., Associate Professor, Department of Roentgenology, University of Michigan. Radiation Therapy, edited by Isadore Lampe, M.D., Associate Professor, Department of Roentgenology, University of Michigan. Cloth. $6.50. Pp. 453, with 393 illustrations. The Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1949.

This is the eighteenth publication of this year book. The book is divided into two major sections, one on radiologic diagnosis edited by Drs. Fred Jenner Hodges and John Floyd Holt and the other on radiation therapy edited by Dr. Isadore Lampe. The editors have followed the usual pattern of previous editions. The articles selected for abstract cover the major developments in radiology published between June 1948 and June 1949. The abstracts are sufficiently detailed to present the substance of the original publications. There is a noticeable paucity of foreign sources as compared to those of some years ago. While this year book offers a valuable source of information on the newest in its field, it covers a number of articles published in other than radiologic journals.

It should be of interest to anyone wishing to keep abreast of radiologic advances. The excellent quality of the abstracts with adequate illustration maintains the same high quality of previous years. The index is complete and informative.

Dental Anatomy: The Form and Function of the Permanent Teeth. By Robert C. Zeisz, D.D.S., F.A.C.D., F.I.C.D., Chairman of the Divisions of Tooth Morphology and Applied Dental Anatomy, University of California, San Francisco, and **The Form and Function of the Deciduous Teeth.** By James Nuckolls, D.D.S., F.A.C.D., Professor of Operative Dentistry, University of California. Cloth. $14. Pp. 486, with 427 illustrations. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1949.

This is a beautifully illustrated textbook written mainly for the undergraduate student of dentistry. The material covered is confined primarily to the external and internal anatomy of each of the permanent and deciduous teeth. The relationship of one dental arch to the other in centric, protrusive and lateral occlusion is discussed sufficiently. A glossary of dental terms used in the text is included.

The orderly arrangement of the material and the use of paragraph headings make the book ideal for quick reference. One feature which contributes to the clarity of the book is the use of well labeled diagrammatic outlines opposite the artist's illustrations. The latter are particularly fine. This book should be of great value to dental students and teachers of dental anatomy.

Medical Photography: Radiographic and Clinical. By T. A. Longmore, Hon. F.S.R., Principal, Kodak School of Medical Radiography and Clinical Photography, London. With a Foreword by Brigadier D. B. McGrigor, O.B.E., M.B., Ch.B., Consulting Radiologist, The War Office, London. Fourth edition. Cloth. Price, 50s. Pp. 1008, with 440 illustrations. The Focal Press, 31 Fitzroy Sq., London W; 381 4th Ave., New York 16, 1949.

This book was originally published in 1944 as a training manual for medical personnel in "H. M. Forces" during the war. Several chapters have been added to the present edition. More illustrations have been included and additional technics are discussed. The book is increased in size from 400 to 3,000 pages. One third of the book deals with radiographic technic. Two thirds are devoted to photographic principles and clinical photography. The material is divided into eight sections covering: the photographic process, photographic considerations in radiography, clinical photography, clinical phototechnic, reproduction and processing, color photography, special technics and an appendix.

Eighty-five pages are devoted to color photography; however, only 10 pages deal with color technics which may be of practical value to the average reader. Several pages are devoted to a discussion of the Dufay color process, which is used more widely in England than in the United States. Apparently the author has had his greatest experience in the field of radiography, since that section is well organized and presents information useful to the x-ray technician. Much of the photographic material is of a type furnished in booklet form by the manufacturers of photographic supplies.

Many physicians will not be especially interested in such material as the basic theory of photography and photographic optics. They would appreciate more information on the practical or useful application of photography to medical subjects.

The bibliography is brief and does not include many references to excellent articles dealing with the subject of clinical photography. The references to the subject of radiography are more complete. The diagrams and photographic illustrations are excellent. X-ray technicians who would like to extend their knowledge to the subject of photography may find this book of some value.

Modern Practice in Anaesthesia, 1949. Edited by Franklis T. Evans, M.B., B.S., F.F.A.R.C.S. Cloth. $12.50. Pp. 566, with 228 illustrations. Paul B Hoeber, Inc., Medical Book Department of Harper & Brothers, 49 E 33rd St., New York 16, 1949.

Dr. Evans, ably assisted by 24 other authors (most of them physicians associated with well known hospitals and medical schools in the London area), has presented one of the most complete volumes now available on the general aspects of modern practice in anesthesia. A wealth of material is concisely presented. The book is divided into 38 chapters. The material is well organized and admirably illustrated. Many chapters are followed by a list of references. An adequate index is included.

This volume begins with an 18 page review of historical events concerned with the advances in anesthesia. The impression is gained that the author is much more familiar with the history of anesthesia in England than in America. He speaks of Horace Wells' clinical demonstration in Boston General Hospital (should be Massachusetts General Hospital), and Crawford Long's administration of ether to James M. Venables (should by Venable) in 1842. Edmund Andrews' valuable contribution in the introduction of the use of oxygen with nitrous oxide in 1868 and Dennis E. Jackson's use of trichlorethylene as a general anesthetic in 1934 are unfortunately omitted. One of Jackson's associates who published an article on trichlorethylene in 1935 was referred to as "Stricker" instead of "Striker."

Particularly to be commended are the inclusion of chapters dealing with fundamental subjects such as anatomy, physiology, chemistry, pathology and cardiology for the anesthetist. These chapters were written by authorities in these various specialties. Blood transfusion and fluid replacement therapy were presented by the pathologist who is the medical officer of the British Red Cross Society's London Blood Transfusion Service.

Surgeons contributed discussions on local analgesia and abdominal field block in combination with light anesthesia, and

anesthesia and analgesia in ophthalmic surgery. Several chapters are devoted to discussions of anesthetic management in various surgical specialties and certain specific pathologic conditions. Valuable guides for the proper anesthetic management of patients with diabetes mellitus or asthma are presented. Shock in relation to anesthesia is also considered. Chapters are included which present some of the more recently considered aspects of proper anesthetic management, such as oxygen therapy, anesthesia in the aged and posture in anesthesia.

Three excellent chapters deal with the preparation of the patient, anesthetic emergencies and postoperative care and treatment. A chapter concerned with volatile narcotics and the anesthetic gases contains up-to-date and important discussions of cyclopropane and "controlled respiration." The role of curare in anesthesia is ably presented. Several of the newer curarines are included.

The book would be enhanced by brief statements in several chapters in regard to the valuable properties of ethylene and its clinical indications, both in certain types of surgery and in the presence of certain seriously disturbed body functions. While the chapter on spinal anesthesia and analgesia contains much important material, no mention is made of the catheter method of fractional or continuous spinal anesthesia. Some aspects of the management of patients during spinal anesthesia are different from practices in this country. Likewise the discussion on anesthesia in obstetrics contains but brief mention of spinal analgesia and suggests that this method, as it is now employed in many institutions in America, has not had much trial in Britain. Certain authors in America are not in agreement with the suggested generous intravenous use of thiopental sodium before the fetus is delivered.

Among other subjects covered are description of apparatus, the signs of anesthesia; premedication; basal narcosis by means of rectal injection; intravenous anesthesia; intercostal, paravertebral, epidural and caudal block; endotracheal anesthesia; balanced anesthesia, and anesthesia in children; thoracic surgery; neurosurgery; repair of cleft palate in infancy; bronchoscopy; thyroid and thymus surgery; genitourinary surgery; rectal surgery, and dental surgery. Occasional instances of British drug terminology may confuse the American reader; however, the minor criticisms of this volume should not detract materially from its excellence as an up-to-date textbook on anesthesia for international use.

Industrial Microbiology. By Samuel Cate Prescott, Sc.D., and Cecil Gordon Dunn, Ph.D., Associate Professor of Industrial Microbiology in the Department of Food Technology, Massachusetts Institute of Technology. Second edition. Cloth. $8.50. Pp. 923, with 124 illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 18; Aldwych House, Aldwych, London, W.C. 2, 1949.

Although in their introduction the authors state, "Industrial microbiology is that portion of microbiological science which deals with the possible utilization of micro-organisms in industrial processes, or in processes in which their activities may become of industrial or technical significance," the present volume regards industrial microbiology "as the science and art of investigating and controlling technical fermentations, that is, of using micro-organisms as reagents to produce desirable end-products having possible or well defined industrial uses and applications."

The text includes chapters on the fermentation processes associated with the production of alcohols, organic acids and other substances; the role of micro-organisms in food manufacturing and food conservation methods; the production and uses of mold enzyme products; the manufacture of antibiotics, and the microbiology of textiles and wood. Several new chapters have been added since the 1940 edition along with an extensive increase of information in other chapters. Appendixes include discussions of disinfection and disposal of industrial microbiologic wastes.

The volume is well documented with bibliographies, diagrams, photographs and tables. It will interest readers and students who are familiar with the basic principles of bacteriology and biochemistry and those concerned with research and practical application of those sciences.

Clinical Electroencephalography. By Robert Cohn, M.D., Electroencephalographer and Director of Neurological Research, U. S. Naval Hospital, Bethesda, Maryland. Cloth. $14. Pp. 639, with 300 illustrations. McGraw-Hill Book Company, Inc., 330 W. 42d. St., New York 18; Aldwych House, Aldwych, London, W.C.2, 1949.

This is a thick 4½ pound atlas of electroencephalography printed on good paper with 8½ by 11 inch pages. The left hand page contains a concise clinical history and an even more concise description and interpretation of the patient's electroencephalogram. On the opposite page is a reproduction of a 20 second sample of the tracing. There are 273 pages of such tracings. An introductory chapter explains something of the theory and technic of electroencephalography. Patients have been divided into 15 groups on the basis of clinical diagnosis, and the percentage distribution of normal and abnormal tracings has been determined for each group. These results are compared with results for a group of 251 healthy young adults. Records of nearly 4,000 patients are thus analyzed. Altogether, the book represents an immense amount of labor and contains a mass of material of interest to all concerned with electroencephalography and with disorders of the human brain.

Certain limitations have been noted: Observations were made at the United States Naval Hospital at Bethesda, Md.; hence the case material is heavily weighted with young men and with head trauma and headache. For the beginner there might be more detail about technic and the reasons for the classification of individual tracings shown. The person experienced in electroencephalography will find little reference to the observations of other workers or discussion of debatable points in this new field. More complete utilization of the blank spaces on the left hand pages and a reduction in the number of tracings displayed might have resulted in a decreased cost without a decrease in value to the reader.

Pyramideneiterungen: Deren Verhütung und Behandlung. Von Prof. Dr. O. Voss. Cloth. 36 marks. Pp. 256, with 71 illustrations. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; Agents for U. S. A.: Grune & Stratton, Inc., 381 4th Ave., New York 16, 1949.

The word "pyramid" in the title of this book denotes the pyramis ossis temporalis, which includes the mastoid process, and on page 11 it appears that the author has attempted to find a more satisfactory term than the English "petrositis" and the French "l' ostéite profonde du rocher." These questions of terminology are taken up in an introduction which is probably illuminating to readers already familiar with the subject but thoroughly confusing to one in search of a real introduction. It is followed by detailed, well illustrated discussions of the anatomy, physiology, pathology, bacteriology, untreated course and prevention of petrositis. The author's opinions are based on 64 minutely and personally studied cases. An especially valuable part of the book is the 90 page section on treatment, including surgery. Even here, unfortunately, the author's propensity for complex modes of expression makes reading difficult; there are passages in which each sentence in turn represents a hurdle. The book is attractively bound, well indexed and provided with a scholarly bibliography but written with so little regard for the foreign reader that it can be recommended only to specialists in otology with exceptional command of German.

The Rockefeller Foundation International Health Division Annual Report 1948. Paper. Pp. 222, with 13 illustrations. The Rockefeller Foundation, 49 W. 49th St., New York 20, [n.d.].

The Rockefeller Foundation was founded in 1913 "to promote the well-being of mankind throughout the world." The program of the foundation is concerned with certain definite problems in the fields of medical science, natural science, social science, the humanities and public health. Except to a limited degree in public health, the foundation is not an operating agency. It contributes toward those activities of institutions and organizations which give promise of advancing the objectives of its program, and, in addition, in the field of general public health activities and the study and control of certain diseases.

The Annual Reports of the International Health Division of the foundation are not dull reproductions of statistics but are

interesting and absorbing progress notes of the various problems of research and application in the field of public health throughout the world. Malaria, yellow fever and other virus diseases were the chief problems of research in 1948. The division coordinates field work with laboratory research which is performed in its New York laboratories and in other laboratories supported by the division. The 1948 report states, "The aim of the International Health Division in contributing to the solution of public health problems has remained constant: to help these countries help themselves to a higher standard of living by providing funds and counsel for the training of public health personnel, the study of public health problems and the demonstration of modern public health methods." The Division sponsored a pamphlet entitled "Health Hints for the Tropics," which provides clear and detailed information for lay persons on care to be taken in regard to the climate, water, food, insects and insect vectors of disease, immunizations and personal hygiene.

The research, field work and public health problems supported by the division cannot adequately be covered in this review. It includes fascinating sections on selective breeding of mosquitos to produce generations highly susceptible to malarial infection for in vitro studies (the majority of the insects are normally refractory); the use of radioactive isotopes in the water of ponds infected with larvae of mosquitos which transmit yellow fever, to determine distribution of the adult forms (air movement appears to be the major factor), and studies of the etiologic agents of syphilis and yaws, including delineation of the important factors essential to the in vitro survival of virulent Treponema pallidum. Cursory reports of the aid rendered to state and local health services, to medical care programs and to schools for public health education are also incorporated. A table of expenditures which lists all activities for the foundation's public health work from 1913 through 1948 concludes the report; the total expenditures of the international division in 1948 exceeded $89,000,000.

Die Erkrankungen der endokrinen Drüsen. Von Prof. Dr. med. et phil. Adolf Oswald. Cloth. Price, 38 Swiss francs. Pp. 580, with 44 illustrations. Hans Huber, Marktgasse 9, Bern 16; distributed by Grune & Stratton, Inc., 381 4th Ave., New York 16, 1949.

This Swiss textbook on endocrinology written in German is arranged according to the usual pattern of books of this type. After an introductory section on the physiology of each endocrine gland, there is a brief discussion of the pathology followed by a summation of the clinical aspects of various endocrine disorders.

The book is well written and arranged but suffers from the serious defect that, although published in 1949, there are only rare references to anything in the literature subsequent to 1937. Apparently the author had no access to the world literature of the last decade; hence the book is entirely out of date as viewed from American standards. This is to be regretted, because the book otherwise appears to be fairly critical and presents succinctly the general subject in a satisfactory manner. There are, however, some minor errors, such as an erroneous formula for epinephrine (page 373) and references to many concepts (e. g., dysproteinism, page 143, and consideration of the prococity of hypothalamic disorders as pineal dysfunction, page 163) which detract from the general value of the book. It cannot be recommended to the American reader.

Investigations on the Course and Localisation of Magnesium Anesthesia: A Comparison with Ether Anesthesia. By Lise Engbæk. Translated from Danish by Aase Holst with the Assistance of Dr. Gerda Seidelin Wegener. Denne afhandling er af det lægevidenskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad, København, 1947. Paper. Pp. 189, with 18 illustrations. Nyt Nordisk Forlag, Arnold Busck, Copenhagen, 1948.

This small volume, translated from the Danish presents a concise review of the pharmacologic effects of magnesium salts, particularly as compared with the effects of ether. It contains reports of considerable experimental work performed by the author as well as an excellent review of the literature on the subject. Its content is largely technical and experimental and will be most interesting to the pharmacologist and experimental worker rather than to the clinical anesthesiologist. The bibliography contains 192 references.

The British Pharmaceutical Codex, 1949. Published by Direction of the Council of the Pharmaceutical Society of Great Britain. Cloth, £3.3s. Pp. 1562. The Pharmaceutical Press, 17 Bloomsbury Sq., London, W.C.1, 1949.

"A book of reference for pharmacists and medical practitioners . . . on all drugs and medicines in common use throughout the British Empire (including those in the British Pharmacopoeia) . . . and a book of standards for drugs and preparations not included in the British Pharmacopoeia," 1948 edition. About 850 monographs are arranged in the general monographs section containing agents not classified under other sections on antiserums and vaccines, preparations of human blood, surgical ligatures and sutures, and a formulary. The monographs contain brief statements on pharmacology and therapeutics, methods of administration, symptoms and treatment of poisoning in the case of the more toxic materials, pharmaceutic uses of drugs, dosages, standards in the case of drugs not in the British Pharmacopoeia and lists of "relevant preparations of the British Pharmacopoeia and British Pharmaceutical Codex." Material on sterilization, solubility and storage often is included. It is interesting that metric values are given first in the dosages and formulas. There are listed in a separate leaflet the brand names most common in the British Empire for substances (or for preparations containing the substances) included in the Codex as generic appellations.

Pharmaceutical Emulsions and Emulsifying Agents. By Lawrence M. Spalton, B.Pharm., M.P.S. Paper. 3s. 6d. Pp. 132, with 4 illustrations. The Chemist & Druggist; Morgan Bros. (Publishers) Ltd., 28 Essex St., Strand, London, W.C. 2, [n.d.].

The purpose of this book is to classify and present the essential practical details relating to a large number of available pharmaceutic emulsifying agents. Addressed primarily to the practicing pharmacist and student of pharmacy, the presentation is inclusive and clear, important principles being repeatedly interpreted.

The author begins with a brief explanation of the fundamental principles of emulsions and then discusses types of emulsifying agents, the use of these agents in the formulation and preparation of emulsions, the methods and mechanics of producing emulsions and the preservation and storage of the finished product.

An excellent classified list of emulsifying agents is included, giving the trade name of the product, its composition, chemical name or formula, its uses and type and the manufacturer. Some slight errors in formula were noted. The lack of an index is a detriment if the book is to be used for reference.

Om den akute kulilteforgiftning: En klinisk studie med særlig henblik paa komplikationerne. [By] Vagn Zahle. [Acute Carbon Monoxide Poisoning: Clinical Study with Special Consideration of Complications.] Denne afhandling er af det lægevidenskabelige Fakultet ved Københavns Universitet antaget til offentlig at forsvares for den medicinske Doktorgrad, 1948. Paper. Pp. 296, with 7 illustrations. Universitetsforlaget i Aarhus, Denmark, 1948.

This work is a monographic account of acute carbon monoxide poisoning, with a special consideration of neurologic sequelae. After a general review of the subject, the author presents a series of 1,304 cases with follow-up study. This series is analyzed with respect to the source of poisoning, sex and age, pathologic conditions existing in the patients before the intoxication, the degree and duration of the impairment of consciousness, acute neurologic symptoms, cerebrospinal fluid findings, immediate causes of deaths (6.1 per cent), postmortem cerebral findings and the residual neurologic changes in the survivors. Neurologic complications developed in 2.1 per cent of the cases, and the histories of these are given. This incidence is about the same as that reported by other observers. The neurologic symptoms are described in considerable detail. From his analysis the author believes that the acoustic, hemiplegic and neurasthenic syndromes are more frequent than previously supposed, while the extrapyramidal, aphasic, apractic and agnostic syndromes are much rarer. He confirms, however, that memory disorders predominate. He found encephalographic changes frequent. The prognostic significance of various preintoxication factors and various acute symptoms is discussed. Older age, especially when associated with arteriosclerosis, predisposed to

a more serious outcome. A decided parallelism was shown between the intensity of impairment of consciousness and the severity of the subsequent course, as might be expected. Disturbances of plantar reflexes and the presence of comparatively rare acute symptoms were frequently followed by a malignant course.

The modern methods of treatment of carbon monoxide poisoning are reviewed, and the author makes a number of recommendations based on his own experience. The effectiveness of any known treatment of late complications is claimed to be slight. In connection with prophylaxis it is recommended that illuminating gas be detoxicated.

The material is freely illustrated with tabulated data and is documented with 511 references. Summaries in Danish, German and English are included. This monograph constitutes an important contribution to the literature dealing with carbon monoxide poisoning.

Huang Ti Nei Ching Su Wên: The Yellow Emperor's Classic of Internal Medicine. By Ilza Veith, M.A., Ph.D., Lecturer in the History of Medicine, The University of Chicago. Chapters 1-34 Translated from the Chinese with an Introductory Study. Cloth. $5. Pp. 253, with 24 illustrations. The Williams & Wilkins Co., Mt. Royal & Guilford Aves., Baltimore 2, 1949.

The Nei Ching, the Chinese classic on internal medicine, attributed to Huang Ti, the Yellow Emperor, is one of the most important early Chinese medical books, particularly its first part, Su Wên, or the "intimate conversations" between the Emperor and his physician Ch'i Pai. Dr. Veith's work is the first extensive translation of a major part of this tremendous collection of medical books into English and constitutes an excellent and critical interpretation of the first 34 chapters of the Nei Ching, together with a comprehensive analysis of the age, authorship and philosophic foundations of the text. The elucidation of the Tao, the Yin and the Yang, the celestial stems and other basic concepts make interesting reading. It is believed that Dr. Veith's book will be favorably accepted not only by members of the medical profession but also by Sinologists, perhaps except for her comments on the so-called "moxibustion" or treatment with burning herbs (usually wormwood (Artemisia)) on specific points of the body. Quoting Nakayama and dictionaries, she derives "moxa" from "moe kusa" (page 72). Some philologists may rather claim that "mogusa" is the name of the herb used for the procedure called "o-kyu" or "yaito" in Japanese. In case of a true verbal contraction "moeru kusa," meaning "grass afire," would perhaps be the more logical origin. This is, however, only a minor detail and does not reduce the great value of the volume. From the point of the physician practicing Western scientific medicine, it is believed that Dr. T. Nakayama's not too critical "Acupuncture et Médecine Chinoise Vérifiées au Japon" (Paris, 1934) and Mr. John Hersey's article on Hiroshima in *The New Yorker*, the only sources quoted by Dr. Veith, are not sufficient proof for the therapeutic efficacy of the treatment with burning herbs. The illustrations of the book are excellent, and the printing is well done.

Physiology of the Nervous System. By John Farquhar Fulton, O.B.E., M.D., D.Sc., Sterling Professor of Physiology, Yale University, New Haven, Conn. Third edition. Cloth. $10. Pp. 667, with 141 illustrations. Oxford University Press, 114 Fifth Ave., New York 11, 1949.

The new edition of this widely used book is up to date and covers the important developments which have occurred since the second edition was printed in 1943. It occupies a position between a textbook and a reference work. Fulton's clear style, economy of words and the flavor added by his interest in the history of medicine have produced a pleasing to read book, and his authoritative perspective has turned it into a well balanced work. The excellent bibliography-index makes the book useful for the researcher, although it will probably be found to be somewhat too abbreviated to serve as anything more than an introduction to the literature in the large field of neurophysiology. The new material which has been added in this edition has been well integrated with the old, and in some cases entire sections have been rewritten.

Histopathology of the Skin. By Walter F. Lever, M.D., Instructor in Dermatology, Harvard Medical School, Boston, Mass. Cloth. $10. Pp. 449, with 221 illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1949.

This is the best monograph on histopathology of the skin to become available in English. The author, who is a member of the department of dermatology, Harvard Medical School, has had long experience in the teaching of dermatopathology to graduate students and in the difficulties which this field of pathology presents to the general pathologist.

The skin, being the most available organ of the body, is being subjected to biopsy with increasing frequency. Such study is regarded as routine in any long-standing eruption and as absolutely essential in any lesion which may be malignant. A considerable number of diseases involving the skin may be diagnosed with accuracy on the basis of the histologic changes; in others, the diagnostic criteria are equivocal. While the general pathologist is ordinarily capable of distinguishing malignant from nonmalignant lesions of the skin, he is frequently at a loss in interpreting various nonmalignant changes exactly, because of lack of experience in skin pathology or understandable lack of familiarity with the complex and at times overwhelming terminology attached to various dermatologic conditions.

In his monograph, Lever indicates clearly those diseases of the skin which may be diagnosed with reasonable accuracy on the basis of microscopic changes and those which may not. A particularly valuable feature is the inclusion of a short clinical description of the disease in question with the more detailed description of the histologic changes. The shortcomings of standard histopathology are not underemphasized, but when the changes present are characteristic the author's descriptions are succinct, clear and informative.

The photographic reproductions, which number 221, are in general excellent. Four colored plates representative of eight different skin conditions are included. The bibliographic references at the end of each chapter are satisfactory and inclusive. The format of the book is pleasing.

This monograph fills a definite gap in American medical literature, and will prove very useful to specialists in dermatology and to general pathologists.

Experimental Cell Research: Supplement I. Edited by Torbjörn Caspersson and Ludwik Monné. Published with the Aid of Grants from the Swedish State and from the United Nations Educational, Scientific and Cultural Organization. Proceedings of the 6th International Congress of Experimental Cytology, Stockholm, July 10th-17th, 1947. Cloth. $10. Pp. 603, with illustrations. Albert Donnier, Stockholm; Academic Press, Inc., 125 E. 23rd St., New York 10, 1949.

This volume contains 123 papers on various aspects of cytology, including the histology, biochemistry and physiology of the cell. The authors are outstanding experts in the fields discussed and conduct their research in laboratories in all parts of the world.

The volume is divided into eleven sections. The first deals with chemical constituents of protoplasm but is concerned primarily with protein synthesis and structure. The second section, on the submicroscopic structure of the cell, contains a number of papers reporting studies utilizing the electron microscope. Two papers deal with the structure of nerve cells.

The genetic aspects of cytology are thoroughly covered in the third section, in which papers on chromosomes, gene structure, mechanics of mitosis, nuclear cytochemistry and chemical reactions between viruses, chemicals and physical agents and genes are discussed.

A section is devoted to the chemistry and cytology of viruses and bacteria. Particular attention is devoted in several papers to protein nucleotide metabolism of these organisms. Another section, containing two papers, discusses quantitative studies on compliment and certain serologic aspects of erythrocytes.

Muscle chemistry and structure are discussed in five papers, the principal emphasis being on the interpretation of studies utilizing electron microscopy. The chemistry of the muscle proteins is discussed in a comprehensive paper.

A section on cell metabolism contains a number of papers, many of them brief, on detailed aspects of certain metabolic actions of cells. Similarly, a short section on cell permeability presents four papers on specific phases of permeability. One, on the intestinal cell in fat absorption, has obvious clinical implications.

A long section on correlations between structure and function of the cell contains numerous papers on specific topics. However, the general impression gained is that there is yet much to be learned before correlations can be made which will have value in prediction of function from an examination of structure.

The section on tissue culture is of interest in demonstrating the great advances in this technic that have been developed in the past 40 years. The variety of cell types amenable to culture is large, and studies of the reactions of pure cell cultures to various chemicals provide the basis for future chemotherapy of such diseases as cancer. Also, some of the cellular reactions of disease are explainable on the basis of reactions observed in tissue culture.

The section on developmental physiology thoroughly covers cellular growth and differentiation. Particular attention is paid, in many of the papers, to the mechanisms controlling cell multiplication and differentiation.

The papers in this volume all present the results of original work. Thus, the book is intended for one already well versed in experimental cytology. Biochemists, physiologists, zoologists and bacteriologists will find papers of interest in this book.

Cancer of the Esophagus and Gastric Cardia. Edited by George T. Pack, B.S., M.D., Clinical Professor of Surgery, New York Medical College, New York. Cloth. $5. Pp. 192, with 25 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1949.

This symposium deals with one of the more recent extensions of the scope of radical surgery for carcinoma. It represents clearly the present fairly standardized surgical concepts of radical resection of the esophagus and gastric cardia for carcinoma. Various surgeons who have been greatly interested in this field and who have contributed considerably to the development of these operations have presented their experiences covering many important aspects of this problem. The book includes historical background of the development of the various early operations which finally have led to present day radical resections, with restoration of the continuity of the upper gastrointestinal tract within the thorax. There is a thorough and reemphasized discussion of diagnosis, preoperative and postoperative management and of the different methods of surgical approach and the now accepted methods of restoring the intestinal continuity after radical resection.

In addition to the important aspects of the clinical management of patients with cancer of the esophagus and gastric cardia, the eighteen contributors to this symposium have presented the important technical aspects of the various surgical approaches to this area—the left transthoracic, transdiaphragmatic approach; the left abdominothoracic approach; the left abdominal and right transthoracic approach; the cervicoabdominothoracic approach, for all levels of resection; the reestablishment of continuity by mobilization of the stomach and displacement of this organ into the thorax and into the neck for anastomosis, and the use of the jejunum by the Roux Y for this same purpose, as well as the use of a skin tube in the cervical esophagus. These independent opinions give a valuable summary of the present status of these operations.

The 1949 Year Book of Obstetrics and Gynecology (October, 1948-August, 1949). Edited by J. P. Greenhill, B.S., M.D., F.A.C.S., Professor of Gynecology, Cook County Graduate School of Medicine, Chicago. Cloth. $4.50. Pp. 629, with 132 illustrations. The Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1950.

This book is a record of the important contributions made during the year in the field of obstetrics and gynecology. The articles abstracted are timely and well chosen. The editorial comments are pertinent and lucid and are particularly noteworthy, as the editor depends frequently on his own tremendous experience. The book is recommended to the specialist as well as to the general practitioner.

Monographs on Surgery, 1950. Edited by B. Noland Carter, M.D., Ph.D., Professor of Surgery, University of Cincinnati, Ohio. Advisory Editors: Gynecology, Joe V. Meigs, M.D., Clinical Professor of Gynecology, Harvard University Medical School; Urology, Charles Huggins, M.D., Professor of Urology, the University of Chicago; Orthopedic Surgery, Alfred R. Shands, M.D., Medical Director, Alfred I. duPont Institute of the Nemours Foundation, Wilmington, Del. Cloth. $12.50. Pp. 501, with illustrations. Thomas Nelson & Sons, 385 Madison Ave., New York 17; Parkside Works, Dalkeith Road, Edinburgh 9; 3 Henrietta St., London, W.C.2, 1949.

Loose Leaf Surgery has now adopted a change in policy, dropping loose leaf form, offering a bound volume annually to record advances in surgery. These books will contain monographs on surgical aspects of varied interest, covering up-to-date important advances. This initial volume presents a group of papers on subjects which have received some unanimity of opinion. There has been no attempt to correlate the various subjects discussed, which are: chemotherapy in surgery, carcinoma of the endometrium, nontuberculous, nongonorrheal infections of the urinary tract (a rather clumsy title), modern laboratory technics in urology, the bone bank, the normal and abnormal response of bone tissue, medullary fixation of fracture and arthrodesis of the spine.

There are 501 well printed pages, including some illustrations and an index, which afford the surgeon much meat, well seasoned and up to date. Perhaps not many men have broad enough interest to wish to read and obtain the latest information compiled by highly competent authors on this spread of subjects. However, as the publishers announce that this is an experimental undertaking, probably before subsequent volumes are published, they will know the purchasing reaction of the surgical world.

The volume is a storehouse of plainly written, well culled and interpreted material. Some chapters contain short valuable historical reviews. The chapter on chemotherapy in surgery, a laborious undertaking at best, is impressive. Each section contains a helpful selected bibliography for the real student. Herein lies one of the great values of this effort, since it may be used as an excellent reference for any of the subjects enumerated, whether the interest in them be active today or in five years to come. On the whole, this unique compilation is worthy of commendation to students and surgeons.

Cystoscopy and Urography. By Jas. B. Macalpine, D.Sc., F.R.C.S., Consulting Urologist, Christie Hospital and Holt Radium Institute, Manchester. Third edition. Cloth. $13.50. Pp. 354, with 353 illustrations. The Williams and Wilkins Co., Mt. Royal & Guilford Aves., Baltimore 2, 1949.

First printed in 1927, this volume was reedited and published in 1936, but all the copies of that edition and all the materials for a reprint were destroyed during the raids on London. This edition includes recent advances and reflects modern trends of urologic thought.

Many new excellent colored plates and diagrams have been included. Special attention has been given to the diagnosis of urinary tuberculosis, and this is preceded by a chapter on pathology of that disease. The historical discussion of urologic procedures and instruments is excellent. Cystoscopic instruments and their care is thoroughly discussed. The author has gone to unusual lengths to explain in detail the technic and findings of cystoscopy for the beginner. This book is a valuable addition to the library of any doctor performing cystoscopy.

Handbook of Medical Management. By Milton Chatton, A.B., M.D., Instructor in Medicine, University of California Medical School, San Francisco, Sheldon Margen, A.B., M.D., Clinical Instructor in Medicine, University of California Medical School, San Francisco, and Henry D. Brainerd, A.B., M.D., Assistant Clinical Professor of Medicine and Pediatrics, University of California Medical School, San Francisco. Boards. $3. Pp. 476. University Medical Publishers, Post Office Box 761, Palo Alto, Calif., 1949.

Tightly compressed into this little handbook are a surprising number of facts and a surprising amount of good advice, all presented in crisp outline form. Regardless of the disease, one may find a brief description, the methods of diagnosis, treatment principles and specific details. A number of small handbooks of this type are available, several being the natural outgrowths of local intern's manuals. This is certainly one of the best.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DIZZINESS

To the Editor:—**Is there any effective treatment for vertigo associated with cerebral arteriosclerosis? Hypertension is controlled by diet, including rice and free from sodium.**

M.D., New Jersey.

This inquiry was referred to two authorities, whose respective replies follow.—ED.

ANSWER.—It is not stated whether the vertigo preceded the treatment or not. A low sodium diet, if carried too far, might be the cause. A normal sodium level is absolutely essential. A low sodium diet should not be used unless absolutely indicated, and, when it is used, blood, especially urinary chlorides, should be carefully checked. A simple and useful bedside test for sodium chloride in the urine is that of Fantus (J. A. M. A. 107:14 [July 4] 1936). Insufficient diet, also, might be the cause of the vertigo, especially if it really lowered the blood pressure. If the blood pressure is not reduced, a venesection (500 cc.) will probably afford relief for a few weeks and will be advisable in several respects. It is not easy to eliminate every possible source of vertigo. Ears, eyes, cerebellum, gastrointestinal tract and sensitization must be considered. Purely symptomatic treatment is best accomplished with bromides, or bromides combined with quinine or quinine alone, given night and morning. Hydrochloric acid may help, and strychnine may be of help. Tobacco and liquor should be omitted.

ANSWER.—Vertigo in cerebral arteriosclerosis may occur with the cerebral ischemia associated with the thickened cerebral vessels themselves. When in addition, as in this case, there is hypertension, the question arises as to the presence of left ventricular failure making worse an already reduced cerebral circulation. It is possible that the left ventricular failure would be a greater factor, actually, than the thickened cerebral vessels.

Paroxysmal hypertension and fluctuations in the heart rate and rhythm may cause vertigo. Many different signs of weakness may appear with a sodium-free diet, and vertigo could be one of them. The toxic effects of salt substitutes in certain sensitive persons are well known, especially if the salt substitute contains lithium.

The treatment, of course, is obvious, in that digitalization is valuable in left ventricular failure and in variations in heart rate and rhythm. Some workers effect vasodilatation by the use of nicotinic acid, others by the usual aminophylline and papaverine-like preparations. In the absence of aural disease and in the event of failure with suggestions mentioned, an experimental procedure might be tried, on the assumption that cerebral ischemia is caused by the cerebral arteriosclerosis. It could be justified only in the presence of prostrating disability as a result of the vertigo. This new procedure consists of the use of dicumarol* to depress the prothrombin level to 30 or 35 per cent. Theoretically this would increase the fluidity of the blood and possibly increase the caliber of the cerebral vessels, thereby improving the cerebral circulation.

ARTIFICIAL INSEMINATION

To the Editor:—**A patient has been married twice, several years each time, without producing offspring. He had severe gonorrheal epididymitis in his youth on the left side. Lately he had a severe injury of the right testicle. He wants to know whether any type of aspiration of the testicle and insemination of his present wife would give hope of producing offspring; if not, he would like to know of a reputable center where his wife could receive artificial insemination from an appropriate donor.**

George H. Lancaster, M.D., Weslaco, Texas.

ANSWER.—Severe epididymitis with high temperature, local swelling and pain usually results in destruction of testicular tissue. A biopsy or aspiration of the testicle will establish fertility. Artificial insemination with aspirated spermatozoa is possible. If persistently attempted and if the spermatozoa are normal, success may be anticipated. Treatment with spermatozoa from a properly selected donor can be obtained through the National Research Foundation for Fertility, Nesconset, Long Island, N. Y.

TREATMENT OF PINWORM INFECTION

To the Editor:—**I have an adult patient with pinworms that resist treatment. I would appreciate suggestions.**

Paul H. Cronenwett, M.D., Alameda, Calif.

ANSWER.—Although none of the chemotherapeutic agents used against Enterobius vermicularis, the pinworm, is completely effective, when an adult is not cured after several treatments, one suspects reinfection rather than treatment failure. The pinworm lives about 60 days in man before passing out to the perianal region. Hence, without treatment, the subject would lose his infection in two months. To insure a minimum opportunity for reinfection, all members of the household should be examined with anal swabs. All who are found infected should be treated simultaneously. Failure to examine and treat the whole family may leave infected persons who will reinfect those treated.

Tetrachloroethylene, although not as effective as methylrosaniline chloride (gentian violet), has the advantage that only a single dose may be needed. The treatment of pinworm with tetrachloroethylene is as follows: The night preceding treatment only a light supper of nonfatty foods is allowed, and no breakfast is permitted on the morning of treatment. The adult dosage of tetrachloroethylene (4 cc.) is mixed with a suitable amount of magnesium sulfate in a glass of water. After this mixture is taken, no food should be permitted until after the bowels have moved. Wright and his co-workers found that this method of treatment resulted in a cure in approximately 47 per cent of patients.

The adult female pinworm, when gravid, migrates to the perianal region and there disintegrates freeing her eggs. These infective eggs are distributed in the host's bed and into the house in general. Fortunately, the eggs are not long lived under ordinary conditions. Precautions should be taken, however, to limit their distribution. Infected persons while undergoing treatment should wear close-fitting underpants continually, and these should be washed in boiling water every 24 hours. Bed sheets should be carefully removed from the bed two or three times a week and boiled. The finger nails should be kept short and clean and hand washing before meals and after toilet regularly practiced.

DESENSITIZATION IN ALLERGIC CONDITIONS

To the Editor:—**I have become skeptical about the value of desensitization procedures in allergic disorders, particularly asthma. Is this form of treatment any good?**

M.D., Illinois.

ANSWER.—Analysis of the situation will be aided if consideration is given to some of the causes that produce failure in desensitization: 1. If asthma is used as an example, about 50 per cent cannot be proved to be due to allergy. There is nothing to "desensitize" in these patients, but some laboratories always find positive skin tests, from which the referring physician infers that desensitization is indicated. Some of these patients may be allergic, but in the present state of information their specific allergy is not known. 2. Many, perhaps most, of the specific allergens can be better managed by elimination than by desensitization. For example, dogs, cats, feather pillows and foods are much more easily eliminated. Only in extremely rare situations is desensitization necessary. With respect to foods, hypodermic desensitization is not indicated. Yet one sees continually treatment being given with mixtures of the aforementioned and similar antigens prepared by laboratories, often at the direct request of the family physician. 3. In some instances the exposure to the inhalant is too great to anticipate results by desensitization. Failure is the rule in such a case, and if the exposure cannot be avoided the patient must be told that the likelihood of results by desensitization is small. 4. Desensitization to certain antigens, such as cottonseed or drugs, is either hazardous or its rationale has not been established. 5. Desensitization alone may fail if associated factors (infection, emphysema and nervous strain) are ignored. 6. With the elimination of the preceding types of cases there remain allergic persons with asthma who are primarily sensitive to pollen, molds and dust. These antigens are generally unavoidable and should be employed in treatment of such patients, in whom careful desensitization often will yield satisfactory results. Turning the patient over entirely to the nurse for treatment will certainly diminish the prospects of good results; the patient must be observed personally by the physician. The experienced and conservative allergist readily admits that desensitization is tedious, bothersome, costly and frequently conducive of only temporary results. He will admit further that some patients with present technics are unable to respond with "antibodies" and fail to achieve any demonstrable immunity. However, there is much current research which may improve these imperfections.

To exemplify the effectiveness of desensitization, attention is called to pollen asthma. In the Central States about 35 per cent of those who have ragweed hay fever also have concomitant asthma. Careful, conservative desensitization prevents almost all such asthma. It is common kowledge that such asthma is more effectively remedied by desensitization than is the hay fever. One may summarize the reply by this brief statement: Desensitization is helpful if the patients are properly selected and carefully managed.

OCCASIONAL BLOODY DISCHARGE FROM NIPPLES

To the Editor:—A 40 year old obese white woman complains of painful, swollen breasts, with a yellowish discharge and occasional bloody material from both nipples. Her breasts become full and distended on some days and later become smaller. Palpation shows varying tenderness at different times. The breasts are extremely large and hyperplastic. There is a discharge of milk-like secretion from both nipples but no enlarged axillary glands. She has had three children but no pregnancies during the past five years. Her mentrual periods have been regular. She has experienced occasional hot flushes. Blood pressure is 140 systolic and 86 diastolic. Pelvic examination revealed no abnormalities. Diethylstilbestrol, 2 mg. three times a day, has been tried without benefit. I would appreciate advice.

C. K. Gardner, M.D., Oak Hill, W. Va.

Answer.—The history suggests mesoplasia plus intraductal papilloma. The congestion of the breast followed by regression is probably related to the menstrual cycle. This could be determined by accurate notes on the calendar relative to the days of menstrual flow and the degree of congestion experienced on various days of the month. Although secretion is frequently associated with such congestion of the breast, a bloody tint would be unusual. One, therefore, must consider intraductal papillomas. Two methods of treatment are available. First, restriction of salt and fluid intake with the administration of 1 Gm. of ammonium chloride four times daily. This will have a tendency to lessen the congestion and should influence the amount of secretion within the breast. The second possible method of treatment would be with testosterone propionate, 10 mg. intramuscularly daily, until a regression of the breast with an associated cessation of the discharge has resulted. If, after this treatment and the subsidence of the tension, a bloody discharge is still present or can be elicited by milking, further investigation would be indicated. If it is impossible to localize the lesion, roentgen therapy could be utilized to destroy the papilloma and stop the blood-tinged discharge. If, however, an area of thickening is discovered or a mass can be palpated at any time, this area or mass should be removed for microscopic study.

PENICILLIN AND EPIDERMOPHYTOSIS

To the Editor:—I read an article in a popular magazine which states that penicillin should never be used when a patient has or has had "athlete's itch." I have frequently given penicillin to cure the secondary infection superimposed on "athlete's itch," and I never noticed any ill effects. Would you enlighten me regarding this matter?

James H. Barnebee Jr., M.D., Crowell, Texas.

Answer.—A few patients who receive penicillin may show an exacerbation of epidermophytosis, with an increase in the eruption in the feet and sometimes in the groins. This is not a universal reaction for patients who have epidermophytosis, but it is one that has been observed on occasion. There is no contraindication to the use of penicillin for the treatment of secondary infections superimposed on epidermophytosis, the only caution being that one should look for abnormal hypersensitive reactions in these areas.

SECRETION OF BREAST MILK

To the Editor:—How effective is application of short wave therapy to the breasts to increase milk secretion?

M.D., Indiana.

Answer.—The supply of breast milk after delivery depends on the action of estrogen and progesterone on the ducts and secretory acini and tubules, respectively, during pregnancy and on prolactin, a hormone from the anterior hypophysis, which is believed to stimulate the actual supply of milk. Irritation of the nipples causes an increase in the secretion of milk. This can be demonstrated clinically by placing the baby to the breast early and by using a breast pump. Shortwave therapy to the breasts may be helpful, but it is not a specific means of increasing milk secretion.

TREATMENT OF POLYCYTHEMIA

To the Editor:—I desire information concerning polycythemia. In October 1948 a patient, the younger of two brothers, complained of failing vision in his right eye; he was treated with penicillin in sodium chloride solution for seven days because of optic neuritis. While he was being treated, progressively rising hematocrit and hemoglobin levels were noticed and a diagnosis of polycythemia was made and verified. The older brother was hospitalized in November with severe virus pneumonia. He was allergic to aureomycin and was treated with streptomycin and penicillin. He recovered, but later a hematocrit reading of 66 was observed, which in two weeks, after one venesection (500 cc.), fell to 47. I do not believe that the older brother has polycythemia. The father, a Jew from Central Europe, has had episodes of epistaxis for several years once every three to six months. I feel that this man has the true form of polycythemia which develops in late middle life in Jewish men from Central Europe, with a life expectancy of four to eight years. Is there any record of polycythemia following penicillin therapy? Will the older brother have polycythemia later in life? Is there any form of successful treatment for the younger brother other than venesection when the hematocrit level becomes high? The father has a high normal blood cell count and hematocrit level; the older brother has a normal blood cell count and hematocrit level; the younger brother has responded favorably to monthly bleedings with a fall in the hematocrit reading from 48 to 41 after a bleeding of 750 cc.

Fred J. Phillips, M.D., Quakertown, Pa.

Answer.—There is no published record of polycythemia following penicillin therapy. The administration of penicillin does not produce an increase in the concentration of erythrocytes in the peripheral blood except as a secondary effect in patients who have anemia due to infection, in which event the increase in erythrocytes may be attributed to eradication of the infection. The familial incidence of polycythemia is greater than for the average population. However, this statement is based largely on the reports of specific families. Information which would allow a statement on the actual probability of the disease developing in this sibling is not available, inasmuch as the statistical incidence of the disease in families is not known.

The data presented relative to the older brother suggests a laboratory error. This may be emphasized by the improbability that one bleeding of 500 cc. could produce the reported decrease in the hematocrit readings. If one assumes that the older brother had a total circulating blood volume of 5,000 cc., his red cell volume with a hematocrit reading of 66 per cent would be 3,300 cc. If one assumes that there was no decrease in total blood volume, he would have had a circulating red cell volume of 2,350 cc. when his hematocrit level was 47. This would have been a decrease of 950 cc. of red cells. However, the 500 cc. bleeding with a hematocrit level of 66 per cent would have removed only 330 cc. of red blood cells. Consequently, there would have been a surplus of 620 cc. of red cells which could not have been accounted for by the bleeding. The destruction of this amount of blood intravascularly would have resulted in intense jaundice, which was not observed. Consequently, it would appear that the initial hematocrit reading of 66 per cent was erroneously high, and there is no evidence presented that the older brother actually did have polycythemia.

Polycythemia vera can be successfully treated with radioactive phosphorus. Such treatment may control the disease in some patients for prolonged periods without repeated treatment. However, in other patients the disease is difficult to control with radioactive phosphorus, and carefully regulated repeated doses must be given. In the hands of persons experienced in the use of radioactive phosphorus in polycythemia vera, such treatment can be considered desirable. In the absence of considerable experience and skill, however, radioactive phosphorus therapy must be considered extremely hazardous. The use of phenylhydrazine and acetylphenylhydrazine for polycythemia vera is not as satisfactory a form of therapy as is venesection. In a young, healthy, adult male venesection is the method of choice.

CONTINUED LACTATION AFTER DELIVERY

To the Editor:—A 24 year old woman has lactated since her delivery three and one-half years ago. Basal metabolism and results of physical examination are normal. The breasts feel normal, but milk can be easily expressed. There has been no response to androgen therapy. Please advise as to treatment and whether she should become pregnant.

M.D., Connecticut.

Answer.—This phenomenon is not uncommon, and there is apparently no danger connected with it. Attempts to express the milk should not be made, as this tends to keep up the milk supply. There is no apparent reason why the patient should not become pregnant.

ACUTE MYOCARDIAL INFARCTION

To the Editor:—**A man aged 56 had agonizing substernal pain which radiated down both upper extremities and which required the administration of 0.05 Gm. of morphine for relief. The syndrome was clinically compatible with acute myocardial infarction. He was given dicumarol,® and his progress was satisfactory for eight days, when he had simultaneous hematemesis and melena (small quantities of tobacco-juice material which tested 4 plus for blood) and excruciating pain in the right upper extremity which required 0.1 Gm. morphine intravenously for relief. The leukocyte count on the following day was 26,000 per cubic millimeter, and the blood urea nitrogen level was 20 mg. per hundred cubic centimeters. In seventeen days following this bout of pain the patient had intermittent bouts of pain varying from moderate to severe, requiring from 0.016 to 0.1 Gm. morphine given intravenously. He had intermittent tarry stools, and the erythrocyte count fell from 4,500,000 to 3,600,000 per cubic millimeter and the hemoglobin from 14.6 to 9.8 Gm. At present the stools are brown, the leukocyte count and differential count are normal and the blood urea nitrogen determination is 19.8 mg. per hundred cubic centimeters. Serial electrocardiograms have from onset shown gradually increasing auriculoventricular block, from a P-R interval of 0.32 second on the admission tracing on to the Wenckebach phenomenon and now complete auriculoventricular block with a pulse rate of 40. No proof of infarction has appeared; no Q waves have developed, nor have R waves disappeared. Varying electrocardiographic evidence of ischemia (diphasic T waves and flat T waves) has been manifested. Alteration of S-T segments has been absent. Unipolar leads have been used, and also augmented unipolar leads, but no additional diagnostic help has been forthcoming. The blood pressure, which was 170 systolic and 100 diastolic on admission, has gradually fallen to 102 systolic and 60 diastolic on the left and 122 systolic and 64 diastolic on the right. The two radial pulses have been synchronous. The patient is robust. There is no historical or clinical evidence of hepatic cirrhosis or malignancy. Several consultants are as puzzled as I. Dicumarol® has been freed of responsibility for bleeding, since prothrombin values were 100 per cent when the last episode occurred. It seems possible that dissecting aortic aneurysm could account for this syndrome, but it is difficult to explain melena on this basis. Of course, bleeding peptic ulcer may account for the bleeding, but it seems more plausible to account for all the abnormalities on the basis of a single diagnosis.** **Robert G. Lehman, M.D., San Pedro, Calif.**

ANSWER.—The case cited is extremely interesting and puzzling. Although the presentation is excellent, any opinion given without an opportunity to personally examine the patient and his records is speculative. This illness does not seem to be the result of dissecting aneurysm of the aorta. The distribution of the pain is not consistent with this diagnosis, and there is no objective evidence to suggest involvement of the primary branches of either the thoracic or abdominal aorta. Hemoptysis, hematemesis and melena have been described in association with dissecting aneurysm. Hemoptysis and hematemesis are commonly the result of rupture of the aorta into a bronchus or the esophagus, and the subsequent hemorrhage is massive. If the aortic dissection involves mesenteric arteries, it results in infarction of a segment of bowel. Melena or bloody diarrhea may ensue, accompanied with the signs and symptoms of intestinal obstruction.

The most likely diagnosis in this instance is acute myocardial infarction. The evidence is adequate to substantiate this diagnosis. The distribution of pain is consistent, and the changes noted in serial electrocardiograms are most significant. Auriculoventricular block is an uncommon complication of acute myocardial infarction but has been reported as occurring in 3 to 4 per cent of cases. In such instances the area of infarction may be small, which may account for the absence of dramatic changes in these electrocardiograms. The appearance of pain in the right upper extremity on the eighth day of illness is difficult to explain. It may have represented (1) pain accompanying extension of the area of infarction or (2) the onset of reflex dystrophy pain, i. e., shoulder-hand syndrome. Since additional electrocardiographic changes did not appear, it would seem not unlikely that a right upper extremity pain persisting seventeen days indicates the development of reflex dystrophy. The hematemesis and melena exhibited by this patient is explained best by assuming the presence in the stomach or duodenum of a lesion, distinct and separate from the primary illness, which began to bleed under the impetus of dicumarol® therapy.

GOAT'S MILK AND PEPTIC ULCER

To the Editor:—**Is there anything to a popular belief that goat's milk has particular value in the treatment of peptic ulcer?**

M. S. Rayman, M.D., Two Harbors, Minn.

ANSWER.—No. The use of goat's milk in the treatment of peptic ulcer has been popular in Russia and the Balkan countries since the early twenties. Although many articles have appeared in the foreign literature claiming it to be superior to cow's milk, no convincing data have ever been presented to prove that it has a greater buffering capacity than cow's milk.

BEER, "CELLULOSE DOPE" AND PARALYSIS

To the Editor:—**A patient has worked spraying airplane wings with "cellulose dope." The name of the material used was obtained from the Quonset Naval Air Base. I could not get any more specific information. Just before admission to the hospital, the patient had drunk 20 glasses of beer and yet was able to walk into his home. Once there, however, he collapsed, and, when picked up and placed on the bed, he could not move his arms or legs. He could talk rationally. In falling he struck his head against a radiator, but roentgenograms showed no damage to the cervical portion of the spine or skull. He has been in the hospital three weeks and is gradually improving. He can walk in the "walker," and his double wrist and ankle drop is less pronounced. Is this "cellulose dope" poisonous, and is there any specific treatment?**

D. A. Smith, Newport, R. I.

ANSWER.—Information in this query is not sufficient to permit a precise reply. The term "cellulose dope" covers scores of chemical mixtures. The solvents for nitrocellulose and cellulose acetate, together with thinner materials, include numerous toxic agents. Triorthocresyl phosphate and closely related chemical substances employed in lacquers as plasticizers can induce the pathologic condition described, particularly the double ankle and wrist drop. This phosphate was the source of "Jake paralysis" of the prohibition era. This substance is readily absorbed through the skin. With a boiling point of 410 C., its natural evaporation is trivial, but in an industrial spray its inhalation as a mist is facilitated. This patient's state should be reappraised in relation to this plasticizer's action.

Peripheral neuritis from chronic alcoholism may not be denied. Any person who imbibes 20 glasses of beer in an afternoon has had alcohol before and often. For treatment, in addition to physical therapy, a high intake of vitamins, including thiamine, may be beneficial.

AMENORRHEA AFTER TONSILLECTOMY

To the Editor:—**A woman aged 23 in May 1949 had swollen, painful knees and was unable to walk. She had large hypertrophic infected tonsils and a long-standing lesion of the mitral valve. She did not have cardiac decompensation and responded to penicillin therapy. The rheumatic condition of the knees cleared, and I removed her tonsils in June 1949, following which she has failed to menstruate. Urine examination for pregnancy was negative. I gave chorionic gonadotropin, progesterone and estrone. She continues to have amenorrhea; otherwise her general condition is excellent. What measures might be of help?**

Hamlin B. Lindsay, M.D., Washington, Ind.

ANSWER.—Amenorrhea occasionally follows psychic or physical trauma, and not infrequently it results from malnutrition. In this case the shock of tonsillectomy may be responsible for the absence of menstruation. A simple way to induce uterine bleeding is the procedure recommended by Zondek. The patient should be given 25 mg. of progesterone intragluteally on two successive days (or, more economically, 12.5 mg. of progesterone and 2.5 mg. of estradiol benzoate intragluteally on two successive days). The interval between the second injection and the commencement of menstruation varies from seventy-two to one hundred and twenty hours. The combination of progesterone and estradiol benzoate may be purchased in ampuls prepared by a pharmaceutical company.

OSTEOMA IN OCCIPITAL REGION

To the Editor:—**Please give the differential diagnosis and accepted treatment for an osteoma in the occipital region. Do these tumors ever become malignant? What symptoms would a tumor of this sort produce?**

M.D., New York.

ANSWER.—The differential diagnosis depends mainly on the roentgenographic appearance, and sometimes tangential views are helpful. The conditions which must be considered in the differential diagnosis are angioma and meningioma. The osteolytic lesions of the skull, including myeloma, giant cell tumor, osteoid osteoma and eosinophilic granuloma, are more readily excluded. The usual osteoma produces a rounded, dense, homogeneous shadow protruding from the outer table of the skull.

The standard treatment for this condition today is surgical removal, particularly if the lesion shows signs of increase in size or extent. Malignant degeneration or transformation may occur but is rare, and complete surgical removal of the original osteoma should not be followed by recurrence or malignant degeneration. Other methods of therapy, including irradiation treatments, are not helpful and should not be employed.

The signs and symptoms produced are usually the presence of a bony swelling and a mild degree of pain, although there may be no pain.

EFFECT OF PNEUMATIC HAMMERS ON FINGERS

To the Editor:—Is there an industrial hazard in the operation of pneumatic hammers? A man aged 40 presents an arterial insufficiency involving the index finger of the left hand accompanied with a trophic ulcer of the tip of this finger. This man is employed in a foundry. From 1933 to 1939 he operated a pneumatic hammer. About 1939 he noticed that the index finger of the left hand was blanching on exposure to cold. This condition has persisted even though during the past ten years he has not been operating a pneumatic hammer. At present he presents the clinical picture of unilateral Raynaud's disease. Physical examination has revealed no other abnormality, except grade I pulmonary silicosis. The left index finger turns "dead white" whenever it is in contact with cold. On palpation, there is a definite temperature change in the left index finger involving the distal two thirds (approximately) of the finger. This temperature change is apparently present at all times. The patient believes that the tight grip of the index finger on the compression hammer along with vibratory trauma when the tool is in operation has caused the damage. Can this be classified an occupational disease? What treatment should be employed?

G. K. Parke, M.D., Akron, Ohio.

Answer.—A variety of lesions have been associated with the use of vibrating tools. Some are vascular and some neuropathic. Heavy tools may cause tenovitis and joint damage. The frequency of vibration largely determines the type of damage, but the amplitude is likewise a modifying factor. In operations involving high vibration, low amplitude exposures and low temperatures are highly significant. The terms "white fingers" and "dead fingers" repeatedly appear in descriptions, and the left index finger (in right handed persons), which is on the guiding rather than the holding hand, is most frequently initially involved. The present instance is somewhat typical except in three respects: The duration is extraordinary for pure vibration disease; the type present usually is caused by high speed tools, and in such a severe condition some additional fingers might be expected to present damage and earlier probably did. Gangrene is known to arise but is rare. Persons with silicosis and cardiac impairment sometimes have clubbed fingers. A relationship with "white fingers" and "dead fingers" is not known. Treatment with nicotinic acid may be of value. Data may be found in "Effects of High Speed Vibrating Tools on Operators Engaged in the Airplane Industry" (Dart, E. E.: Occup. Med. 1:515 [June] 1946) and "Occupation and Health: Encyclopaedia of Hygiene, Pathology and Social Welfare" (Geneva, Switzerland, International Labor Office, 1934, vol. 2, and supp.).

COLORED PERSPIRATION

To the Editor:—I have observed 2 patients who are undernourished and in poor physical condition. A definite iron deficiency anemia was present in each. The main point of interest to me was the statement that their perspiration had begun to stain their underclothes yellow since the beginning of their illness. In each case it was impossible to remove the yellow stain from the clothes by the usual methods of washing.

Beaufort A. Spencer, M.D., Bloomington, Ind.

Answer.—Chromhidrosis of various colors is now detected with such frequency as no longer to constitute a medical curiosity. The sweat may be black, blue, green, brown, red or yellow. Colored sweating may be limited to small areas, such as around the eyes, or become generalized. Green sweating occurs among some workers exposed to copper. Cyanhidrosis (blue sweating) has been associated with abnormal indol metabolism. It is believed that the blue color may be acquired on the skin's surface immediately after colorless perspiration. Pseudochromhidrosis relates to colored sweat produced by admixture with substances or organisms on the skin's surface. Dissimulation is common. At present yellow and red chromhidrosis are attributed to the action of bacteria or fungi on the surface of the skin or lying deep along the hair shaft or within the sudoriparous canals. A variety of organisms have been segregated, particularly Trichomycetes palmellina. In chromhidrosis, it is not necessary that hyperhidrosis exist. Some victims appear to be in full health, but more often this condition is encountered among emotionally unstable, neurotic persons, with greater frequency among women.

RIDGING OF THE NAILS

To the Editor:—A 65 year old patient has pronounced vertical ridges of the finger nails. What is the cause of this disturbance? The urine and blood cell count are normal. There is no fungus or other infection present.

M.D., New York.

Answer.—Vertical ridges indicate some permanent alteration in the growth zone of the nail. Most often it is a congenital defect. Arsenic poisoning is said sometimes to be a responsible factor; also injury due to roentgen rays. Transverse ridging of the nails often indicates a recent severe illness, perhaps a period of nutritive deficiency. No single vitamin has been incriminated.

CHEWING TOBACCO

To the Editor:—I am asked almost daily whether chewing tobacco could affect certain persons the same way as smoking cigarets, cigars or a pipe. My answer usually is yes.

I. S. Easton, M.D., Fairview, Ill.

Answer.—Chewing tobacco results in absorption of nicotine and symptoms of nicotine effects similar to those from smoking cigarets, cigars and pipes. The chief effects of tobacco on the cardiovascular system, the central nervous system and the autonomic nervous system are from nicotine and, therefore, occur with chewing the same as with smoking tobacco. However, the local effects of chewing tobacco, on the mouth and particularly on the teeth, are much greater than from smoking.

SEX ABILITY FOLLOWING ORCHIECTOMY

To the Editor:—A patient complains of inability to perform marital sexual act. He is 58 years of age. He has mild diabetes mellitus. About 25 years ago he had a left orchiectomy. His present complaint dates back about two years, when he noticed that his erection would not remain long enough to perform the sexual act. Would testosterone give this patient relief, and was the orchiectomy the cause?

Samuel S. Schept, M.D., Union City, N. J.

Answer.—It is not possible to express a satisfactory opinion without more information. The difficulty the patient is having with erections may be the result of a glandular deficiency, or it may be psychogenic in origin. He should be examined carefully to determine whether hypogonadism of a primary or secondary nature is present. If hypogonadism is present, it is probable that the intramuscular administration of 25 mg. of testosterone propionate three times a week will relieve his condition. If the cause is psychogenic in nature, glandular therapy probably will not help. The fact that his erections do not persist long enough to perform the sexual act suggests a psychogenic or neurogenic basis for his difficulty. The removal of the left testis at the age of 33 may be a factor, although in most instances one testis is adequate.

UNDEVELOPED GENITALIA

To the Editor:—What is the optimum time to start treatment of a boy with poorly developed genitalia and absent secondary sex characteristics but without any other signs of endocrine dysfunction? What is the treatment of choice, testosterone propionate or chorionic gonadotropin and in what dosage?

M.D., New York.

Answer.—The optimum time to start treatment in a boy with hypogonadism is at about the age of 12 years. If treatment is delayed until the age of 15 or 16, it may be impossible to produce maximum development. The boy should be carefully studied to ascertain that hypogonadism is present before treatment is started. Delay in the onset of puberty is sometimes observed without any glandular disturbance. If one or both testes are in the scrotum, chorionic gonadotropin should be used. The dose varies from patient to patient, but in most instances the intramuscular administration of 500 international units three times a week is adequate. If both testes are undescended, chorionic gonadotropin should be tried first. If there is no response, testosterone propionate should be used in a dose of 25 mg. three times a week by intramuscular injection.

PAROXYSMAL AURICULAR TACHYCARDIA

To the Editor:—It was stated in The Journal, Nov. 19, 1949, page 886, in response to a query on the treatment of paroxysmal auricular tachycardia, that "neostigmine 1/150 grain (0.4 mg.) has been reported of value." This dose is definitely insufficient. In our studies, we showed that the required dose for adults is 1 mg., which is 2 cc. of the 1:2,000 solution of neostigmine methylsulfate. This may be effective in itself or with carotid sinus pressure. The attack will usually subside within 20 minutes. In our experience, a dose of 1 cc. or 0.5 mg. has been ineffective. Insufficient dosage is one of the main causes of failure.

Samuel Waldman, M.D., and Louis Pelner, M.D., Brooklyn.

HEAD INJURIES

To the Editor:—In *The Journal* Jan. 14, 1950, page 144, the answer to the query by Dr. Walter Newman of Springfield, Mass., on the rationale of keeping patients awake after head injuries, missed the point. Where a head injury is considered of sufficient intensity to cause an epidural clot, there may be a lucid interval of even several hours, and then coma may develop. For this reason we ask that the patient be awakened (not necessarily shaken) every half-hour for a few hours, to ascertain that the sleep is a natural sleep. If an epidural clot causes coma, surgical intervention may be life saving.

Edward T. Wilkes, M.D., Sunnyside, N. Y.